Forecast for '56

Chemical Week

December 31, 1955

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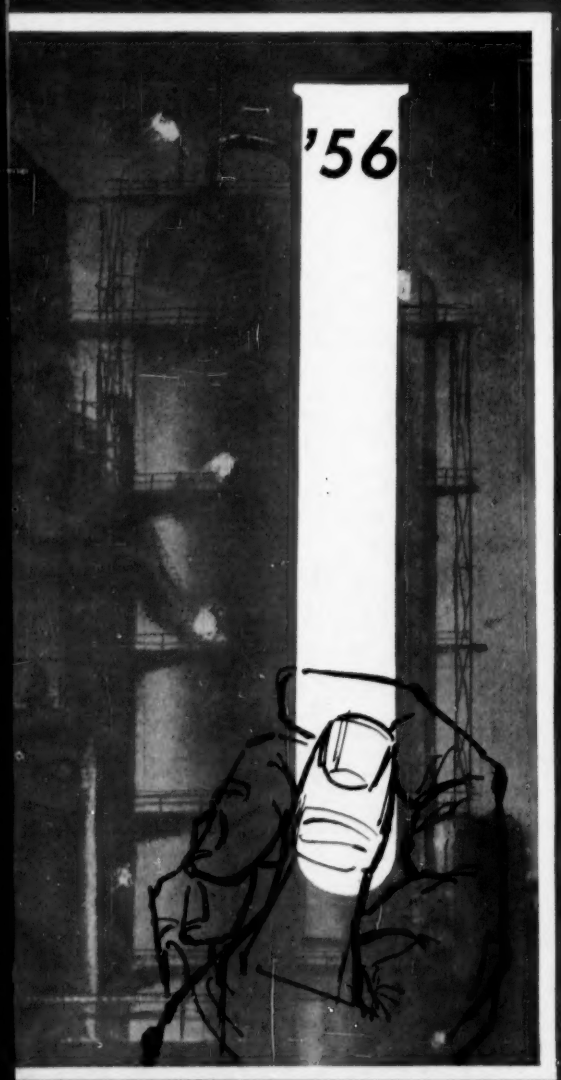

Industry leaders gauge the tenor of the next 12 months . . . p. 27

New plants will come onstream; here's a checklist . . . p. 30

What's ahead for earnings, taxes, tariffs, manpower, labor relations, financing, antitrust activities, marketing, chemicals and specialties markets, and technological developments . . . . . p. 39

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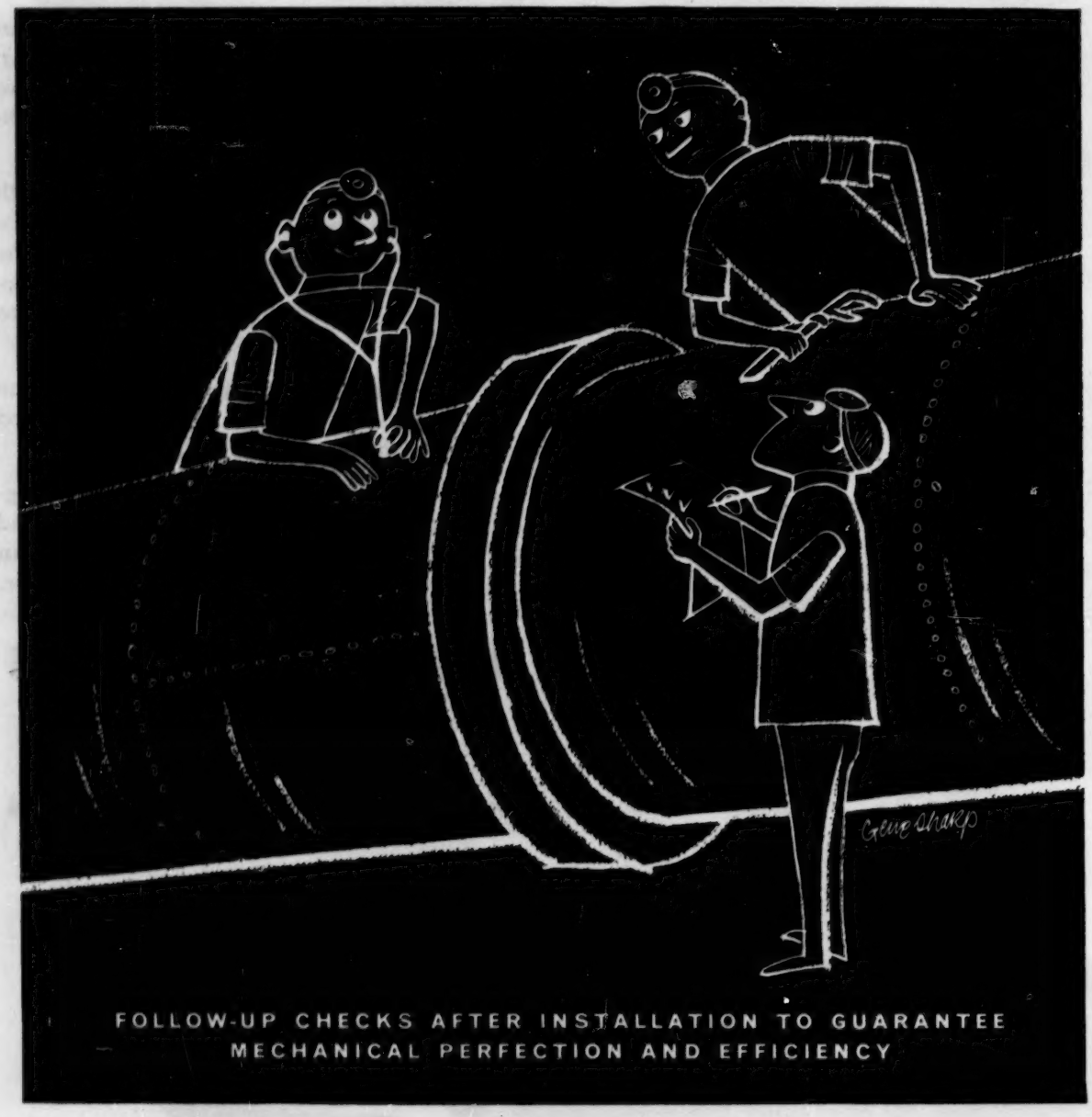

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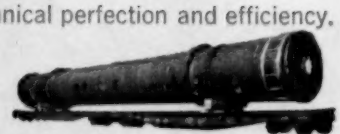

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TOP OF THE WEEK

Top chemical executives see 1956 as a year of almost unparalleled prosperity—but taxes, manpower, foreign competition will pose challenges .....p. 27

Despite the large capital outlay of the past several years, 1956 will see a large number of production facilities starting up operation .....p. 30

Tariffs and taxes, manpower and financing, markets and marketing, products and processes—all will be newsworthy in the 12 months ahead .....p. 39

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Goodrich-Gulf faces hurdle in acquiring Institute rubber plant

Are all the chemical cuts negotiated since '34 legal? Issue raised in new suit

14 Early 1955 earnings estimates put sales up 15%, earnings up close to 20% over 1954

15 WASHINGTON ANGLES

16 New bundling-up scheme in labor: independent unions map multiple merger into own federation

21 CHARTING BUSINESS

27 FORECAST FOR '56
Appraisal of the coming year by eight industry leaders

30 CW survey shows what plants will come into production during the year

39 Earnings outlook: a 15-20% gain over 1955's top figures
Prospects of a corporate tax rate reduction are dim, although individuals may benefit

40 A few hikes and cuts will be made, but tariffs will generally stay at present levels

41 Neither Republicans nor Democrats will let up on antitrust legislation or investigation
Toughest problem facing industry: technically trained manpower

42 The labor merger will mean harder bargaining, greater organizing effort
Look for a shift away from debt toward equity financing

43 Most chemical commodities will be ample, demand will continue heavy, and prices will rise

45 Most important research trend: nuclear energy studies and applications

46 Production emphasis will be on quality control, process improvement, safety

47 The fast increase in number of households spells specialties prosperity

48 Sales forces will grow, traffic costs will be pared, over-all selling costs will hold steady

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Inviting customers' purchasing agents to sales meetings can pay off

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OPINION. . . . . .

Fuel Fumes Smog

TO THE EDITOR: Having read the article "Smog: Cue for Fuel Additives" (*Nov. 19, p. 127*), we feel that it is advantageous to clarify our position in regard to Kleen-Flo.

Kleen-Flo's merchandising program is not sponsored or approved by the Air Pollution Control District, and the claims made therein are purely those of the manufacturer. Their product has never been tested or approved [by the APCD] . . .

S. SMITH GRISWOLD
Air Pollution Control Officer
Air Pollution Control District
County of Los Angeles
Los Angeles, Calif.

As CW pointed out: "Independent organizations dealing with smog, such as Los Angeles' Air Pollution Foundation, have shied away from suggesting virtually any fuel additive, attachment or fuel change as a means of combating smog . . . The foundation says that "the degree of control that could be gained from improved fuel use in autos would be insignificant." —ED.

Center Stapling

TO THE EDITOR: When you come out with a *CW* Report like that on plastics by Irving Skeist (*Nov. 19*), please have your make-up department revise the stapling plan so that it can be removed *per se!* Words fail to credit his stellar performance . . .

FRED L. THOMAS
Thomas Chemical Co.
Madison, Wis.

Thanks. Sometimes it's mechanically feasible for us to so position a major report; sometimes, however, it isn't. Whenever we are able to, we'll comply with Reader Thomas' recommendation.—ED.

How Near, How Far

TO THE EDITOR: It seems as if the [court case reported in the] news article "Test Case on Injury Claims" (*Dec. 3, p. 34*) was really lacking in men who understand what could happen with fluorine emitted from an aluminum plant. The distance of one mile is comparatively short . . . I have seen damage done at a distance of 12 miles from the plant and men killed at a distance of 2 miles.

It is within the realm of possibility that the damage was even worse than described.

PHILIP SADTLER
Samuel P. Sadtler & Son Inc.
Philadelphia

In our reporting on chemical process companies' air pollution lawsuits, we did not intend to express any opinion on the merits of ranchman Paul Martin's claims against Reynolds Metals Co. We used the phrase "The Martins lived more than a mile from the Reynolds plant" to emphasize how this case differs from those in which suit has been brought either by (1) employees who worked in the plant concerned or (2) people who lived practically next door to the offending plant.

Big difference of opinion among witnesses in the Martin-Reynolds case: whether there was any fluorine-caused injury in this particular instance. CW reported the conflicting testimony on this point and observed that it will now be up to the U.S. Court of Appeals in San Francisco to decide whether the case was properly handled in the trial court at Portland. —ED.

SEE YOU THERE

Weed Society of America, first annual meeting, New Yorker Hotel, New York, Jan. 4-6.

Industrial Mobilization Planning, New England meeting, Hotel Bradford, Boston, Jan. 10.

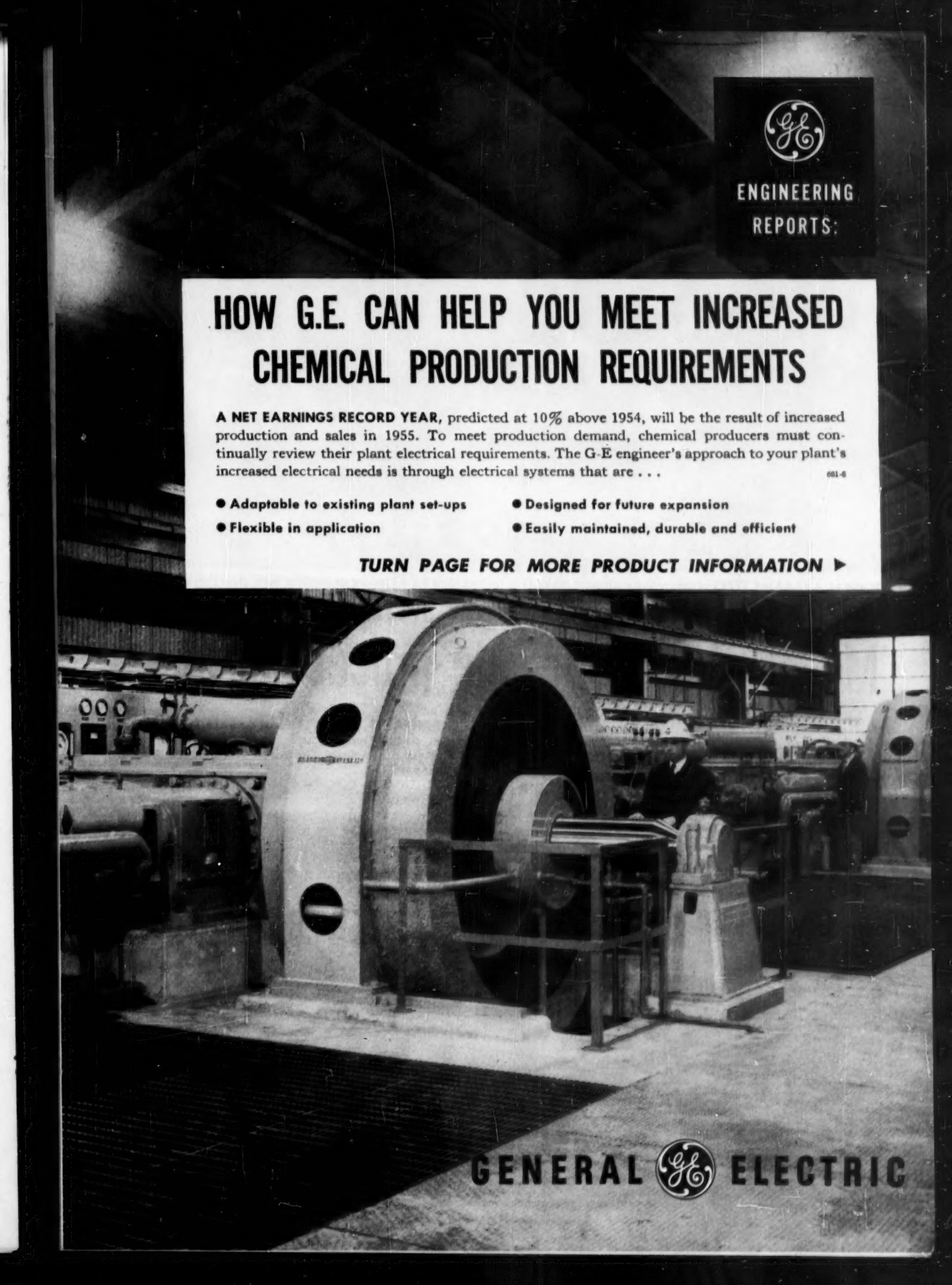
Plant Maintenance & Engineering Show, Convention Hall, Philadelphia, Jan. 23-26.

Assn. of American Soap and Glycerine Producers, annual convention, Waldorf-Astoria, New York, Jan. 25-27.

Chemical and Allied Products Buyers Group of National Assn. of Purchasing Agents, Midwestern meeting, Palmer House, Chicago, Jan. 24; Eastern meeting, Commodore Hotel, New York, Jan. 31.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.


ENGINEERING
REPORTS:
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A NET EARNINGS RECORD YEAR, predicted at 10% above 1954, will be the result of increased production and sales in 1955. To meet production demand, chemical producers must continually review their plant electrical requirements. The G-E engineer's approach to your plant's increased electrical needs is through electrical systems that are . . .
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G-E ENGINEERED DRIVES AND POWER SYSTEMS MEAN . . .

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INCREASED OUTPUT AND EFFICIENCY must close the production gap between available manpower and estimated demand. General Electric electrical systems are designed and installed for efficient, flexible, easily expanded production.

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FOR ADDITIONAL INFORMATION on how G-E engineered systems and engineering services can help you, contact your G-E Apparatus Sales Representative during your early planning at the nearest G-E Apparatus Sales Office. General Electric Company, Schenectady 5, N. Y.

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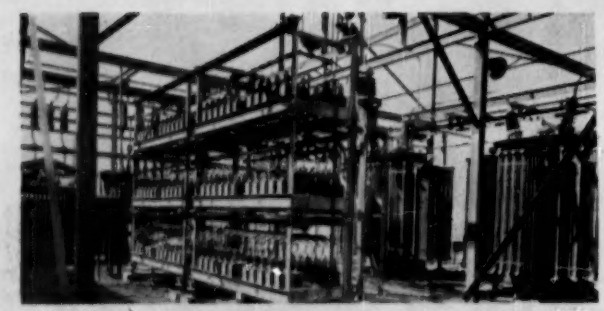
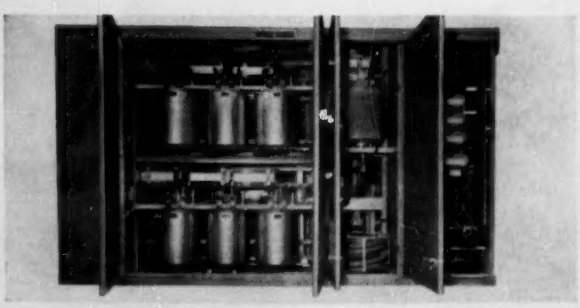
Engineered Electrical Systems for Process Industries

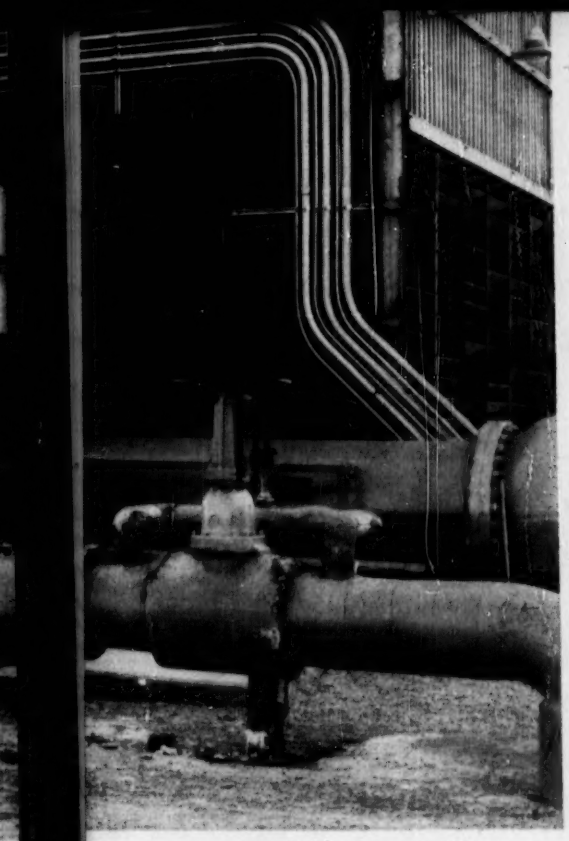
GENERAL ELECTRIC



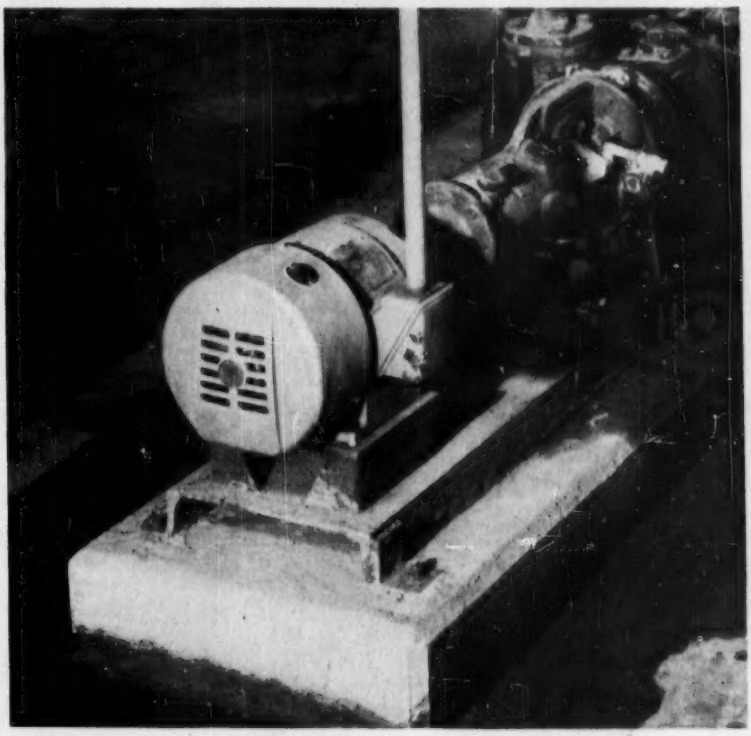
"BUILDING-BLOCK" design of this stack-rack capacitor block reduces installation costs. This design means equipment may easily be expanded or moved to meet plant requirements.



HIGH EFFICIENCY and low installation cost of this pumpless rectifier provide more reliable and economical d-c power. Factory wired, the unit is ready when it arrives to connect and operate.



gives up to 50% longer motor life.



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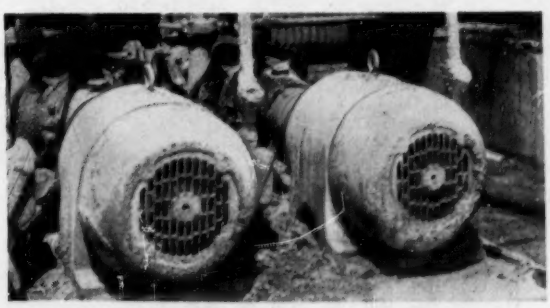
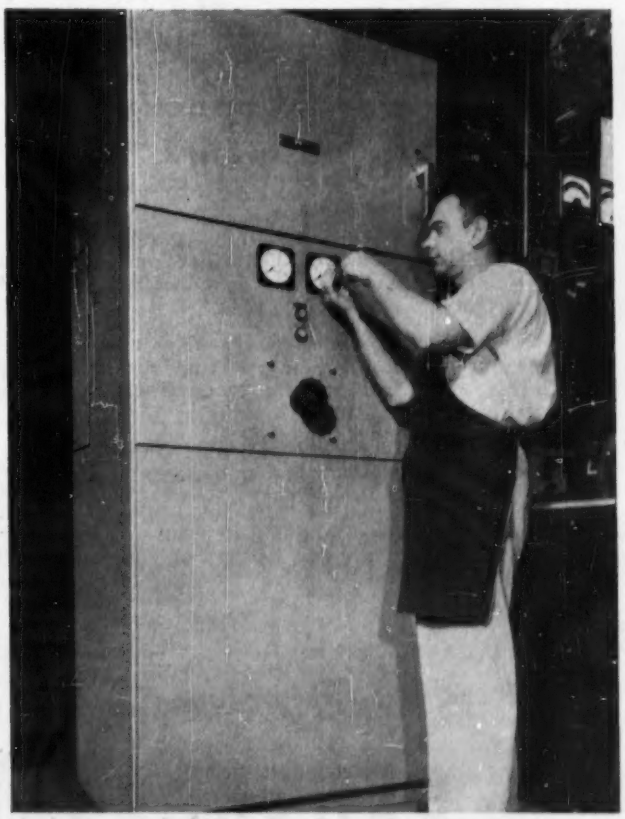


CORROSIVE ATMOSPHERE effects are greatly minimized in these G-E Tri-Clad induction motors. Rugged cast-iron construction makes them excellent for process application.



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Business
Newsletter

CHEMICAL WEEK
December 31, 1955

A further incentive to U.S. chemical companies—to invest more capital abroad—could be one of the New Year's big surprises.

The plan—suggested by B. R. Barlow and Ira T. Wender (who have just finished a foreign investment study for the Harvard Law School's International Program in Taxation)—would set up a new kind of corporation to be given special tax incentives to reinvest its foreign earnings abroad.

In theory, the system would work something like this:

- Any company doing business abroad would be permitted to set up a U.S. Foreign Business Corp. to handle its foreign trade, exports, investments, etc.
- If the corporation used its foreign earnings abroad to make greater investments, it would be allowed to defer payment of U.S. taxes on those earnings.
- If the foreign profits were used or distributed in this country, payment of deferred taxes would then become due.

Washington reaction to the whole idea has not as yet crystallized enough to warrant a guess of the plan's chances in the House and Senate. But industry response to the suggestion has been immediately enthusiastic.

•

Expansion of Scott Paper Co.—both to the north and south of U.S. borders—made year-end news. In Mexico, Scott has concluded an arrangement with Compagnia Industrial de San Cristobal, S.A., whereby it gains a substantial financial and voting interest in the Mexican firm.

And in Vancouver, B.C., stockholders of British Columbia Forest Products, Ltd., have approved a previously negotiated agreement under terms of which Scott is to purchase (over a two-year period) 1 million shares of the Canadian company.

•

Permission to launch an expansion program costing more than $22 million has been requested of the Washington State Public Service Commission by the Washington Natural Gas Co. (Seattle).

Washington Natural Gas now serves the metropolitan areas of Seattle, Tacoma, Everett, Olympia and Centralia; and its expansion move could well encourage the growth of more chemical industry in the entire region.

•

Shell Co. of the Philippines plans to build an oil refinery outside Manila that will be the largest single postwar investment by a non-U.S. enterprise. Negotiations are already in progress between the giant British firm and the Philippines government, but details as to cost and size of the project have not yet been released.

•

First of the major oil companies to go after the expanding market for nonflammable hydraulics will also be Shell Oil.

Already tested in some areas and due for substantial promotion within months, Shell's FR hydraulic fluid is a water-base product that will sell for about $1.50/gal. To date, chemical companies have dominated the hydraulic fluid production field, with products selling in the $2-$5/gal. price range.

Business Newsletter

(Continued)

Chemical bulk shippers may get a price change soon after the first of the year on multiwall paper shipping sacks. The Federal Trade Commission last week charged the 21 leading paper bag manufacturers with illegally conspiring to fix prices, says that all 21 agreed to use the same formula to quote identical delivered prices to customers.

•

Starting this spring, German buyers will be offered foam rubber clothes of a material called Ceolon—described as being feather light, thick, porous, and very warm. Manufactured by Rekord-Gummiwerke (Leonburg), Ceolon can be used for suits, jackets, bathrobes, linings and blankets. It contains 30-80% foam rubber, depending on the use.

•

Looming as a potential threat to the prospering West German chemical industry this week is a serious shortage of German coal miners. At year's end, 1955, there were only 325,000 mine workers in German coal mines, compared with 338,000 in 1954. Result: representatives of West German heavy industry (including a number of leading chemical manufacturers) are engaged in spirited discussions as to remedial means to handle the problem. One favored solution: the importation of Italian miners—who could be attracted by the relatively higher German pay scale.

•

Two official Russian export agencies—Technoexport and Soyuzpromexport—are offering their wares this week to world markets.

Technoexport will sell (according to *Foreign Trade*, official mouthpiece of the USSR Ministry of Foreign Trade) a full line of heavy chemical industry equipment—including integrated ammonia-fertilizer plants, chlor-alkali facilities, varnish, paint, dyestuff, reagent, pharmaceutical, and synthetic rubber units.

Soyuzpromexport, on the other hand, is offering for sale coal, coal-tar pitch, manganese and manganese dioxide, ammonium sulfate, ammonium nitrate, antimony and various precious metals.

•

Farbenfabriken Bayer, A. G. (one of the successor companies of the former German cartel, I. G. Farben) will have recorded a sales volume of $333 million in 1955, and expects a further increase in volume in 1956.

Moreover, capital spending (for new plants and equipment) in 1956 will come close to $50 million, will bring Bayer's total production capacity up to two and a half times its size in 1938—before the start of World War II.

•

And final confirmation of the West German chemical industry's position at year's end, 1955: production (for the entire industry for 1955) is now estimated at a value of $3.5 billion—up 20% over 1954.

And chemical imports (reflecting the strength of the West German buying market) reached $280 million—40% more than last year.

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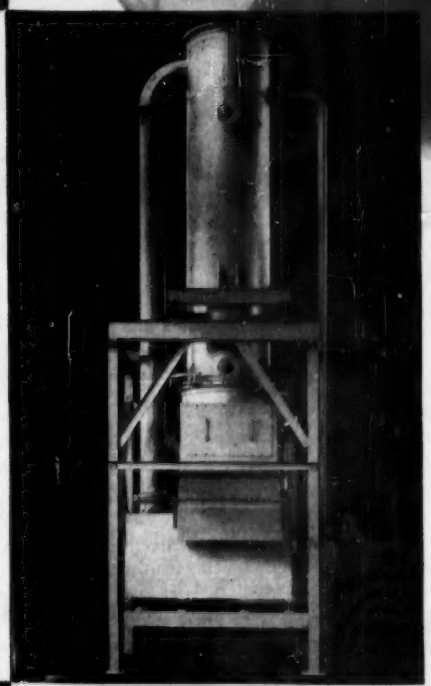

If you have a processing problem, perhaps the Vogt Automatic Tube-Type Molding Machine will provide the answer because it will form and size any liquid that will solidify when cooled, and will discharge by gravity upon heating.

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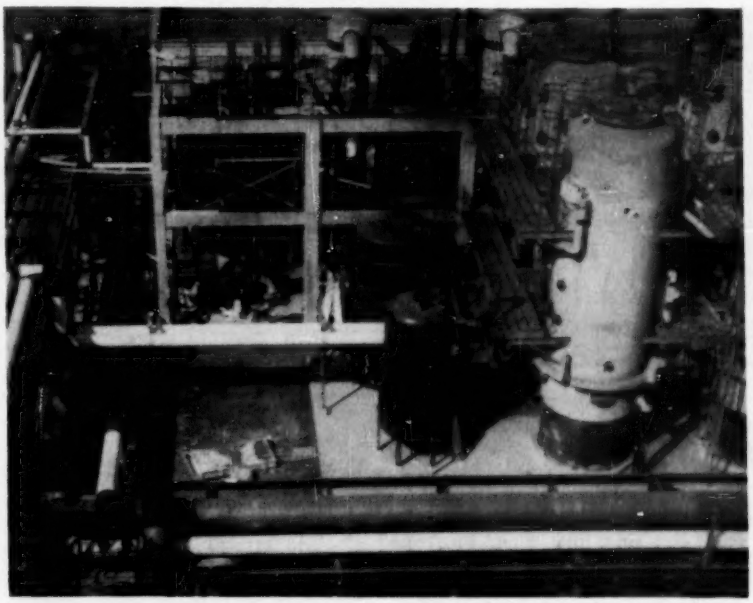
BUSINESS & INDUSTRY . . .



GOODRICH-GULF: Top bidder for the synthetic rubber plant at Institute.

Last of the Twenty Seven

Goodrich-Gulf Chemicals last week came out as top bidder on the government's last-remaining synthetic rubber plant. For a bid of $11 million, the company becomes the prospective owner of the 122,000 long tons/year GR-S plant at Institute, W. Va.

But it is still rather doubtful whether Goodrich-Gulf will get a chance to operate the plant, since such a plant award will give the company 25% of the total U.S. general-purpose GR-S rubber capacity. The contract will get three separate reviews—from Attorney General Herbert Brownell, and from each house of Congress.

The Justice Dept., which has never been happy about competitive conditions in the rubber industry, may recommend against the sale. Making its consummation even more doubtful: whatever the Justice Dept. recommends, the proposal will have an uphill fight in the Senate.

On the Other Hand: There are good arguments for sale to Goodrich-Gulf, however. The price is high for a plant that cannot now make cold rubber and is located some distance from cheap butadiene sources. And the $90/ton of annual capacity price is well above the $53 figure for which one other GR-S plant had been sold. (But it is substantially under the $163/ton that United Carbon paid for the Baytown, Tex., GR-S plant in the most recent government sale last fall.)

Too, the bid of Goodrich-Gulf is reported to be so far above that of any other bidder that the commission felt it could not recommend a different contract, taking both price and antitrust considerations into account.

Tariff Cuts Challenged

Since Congress adopted the late Cordell Hull's reciprocal trade program back in 1934, permitting the President to reduce U.S. tariff rates in return for similar concessions on the part of other nations, average ad valorem duty rates on chemical imports into this country have been sliced by more than 50%. Partly because of these reductions, the volume of chemical imports into the U.S. over that same period has more than tripled.

But this week, management men and lawyers are asking themselves: "What if this whole system is illegal?"

A possibility that the Trade Agreements Act of 1934—foundation of the entire tariff-cutting program—might be unconstitutional is raised in a lawsuit now pending before the U.S. Customs Court in New York. And the plaintiff—Star Kist Foods, Inc. (Long Beach, Calif.)—says it'll carry its fight up to the U.S. Supreme Court if necessary.

Four Faults Cited: Star Kist attorneys—members of a law firm that has handled numerous chemical cases in customs court—are challenging the oft-extended reciprocal trade law on four alleged faults:

- Setting tariff rates is a form of lawmaking, and the Constitution clearly provides that all legislative powers shall be vested in the Congress.
- More particularly, fixing rates of duties is a means of obtaining revenue for the federal government, and the Constitution says that "all bills for raising revenue shall originate in the House of Representatives."
- The reciprocal trade treaties negotiated by the President and the State Dept. are in violation of the Constitutional provision that Congress "shall have power . . . to regulate commerce with foreign nations."
- Those treaties have not been properly ratified by the Senate.

1930 Rates Sought: What Star Kist is particularly asking is judgment that the President did not have the authority to negotiate a 50% cut in the tariff on tuna fish packed in brine. Such a ruling—if upheld in the higher courts—would have the effect of reinstating the rates set in the 1930 (Smoot-Hawley) tariff act, pending action by Congress. One example of how chemical duties would be affected: present rate on flavoring extracts, oils, and essences—30¢/lb. plus 9% ad valorem: 1930 rate, 40¢/lb. plus 25%.

Chemical and Allied Product Industry
Capital Expenditures
Stride Toward Record Levels

(in millions of dollars)

	1954 (by quarters)				1955 (by quarters)				1956*
Chemicals and allied products	309	292	252	277	231	230	239	300*	294
Petroleum and coal products	530	696	682	776	490	730	741	795*	697
Rubber products	32	35	29	35	30	36	39	44*	39
Paper and allied products	104	117	111	124	92	120	142	161*	133
TOTAL MANUFACTURING	2,569	2,859	2,645	2,965	2,249	2,795	2,899	3,377*	3,113

Source: Securities & Exchange Commission; * are estimated figures.

Anodyne for Worry

Along with last week's release of Securities & Exchange Commission estimates of capital expenditures in 1956 (see table above), early chemical industry earnings estimates tie a final bouquet of good cheer on the year 1955.

Most executives prognosticating full-year sales now estimate that the gain this year will be as much as 20%—some even put the figure considerably higher.

American Cyanamid, for one, will have total sales this year of about $455 million and net profits before taxes of $72 million. (Last year, net sales were $398 million; net earnings before taxes, $51 million.) And for 1956, President Kenneth Towe predicts that the company will score close to $500 million in sales.

Firestone Tire & Rubber Co., in the year just ending, will have registered the highest sales and net profits in the company's history. (Sales were $1.1 billion—up from $916 million; net profits after taxes amounted to $55 million, compared with $40.5 million for fiscal 1954.)

Picture Mixed: In view of the somewhat dismal economic forecasting current in the early months of 1955, these figures are especially surprising.

Early this past year, for instance, the Treasury Dept. actually forecast a decline in tax receipts from corporations; in late summer, estimates were revised upward by $2.2 billion (or 8%). But since that time, corporate earnings have soared so fast that the department has raised its sights another $1 to $2 billion.

There is, however, a wide disparity between firms' earnings in the chemical process industry this year. Very large companies, on the whole, have done better from a profit angle this year than have smaller firms (just as they suffered less decline in the slump of 1953-54).

First-half profits of the 200 largest U.S. manufacturers, including most of the major chemical corporations, increased 39% over the first half of 1954 (compared with a 31% gain registered by an average of all manufacturers).

Or from another slant (taking the $100-million-asset figure as a dividing line), large firms increased sales 14% and profits 34% in the first half of 1955 over the 1954 period. Small firms during the same period scored 6% and 24% gains, respectively.

Who Reaps the Proceeds? The record levels of such earnings will benefit both stockholders and company coffers—as well as the Treasury Dept. till.

Dividends, according to the SEC, will probably top $11 billion this year for manufacturing as a whole—up 10% over 1954.

This leaves something around another $11 billion of undistributed profits for capital expenditures and general corporate purposes. (The rise in retained earnings and an ever-rising depreciation allowance should dominate the financing of capital expenditures in 1956; *see p. 42.*)

In the view of such calculations, there's cause for nothing but rejoicing among chemical executives.

Some cautious administrators see political clouds on the horizon that might bring a partial retrenchment in 1957. But no one is going so far as to say that a Democratic victory in 1956 will spell the end of the business boom.

"No political party," quips one company vice-president, "can stem increases in population." The only real question that the chemical industry therefore faces is how much to expand —when—and where.

EXPANSION. . . .

Cement: Giant Portland Cement Co. will expand production capacity at its Hartleyville, S.C., plant at a cost of $5 million.

The addition will lift the plant's capacity about 60%—to 1.1 million bbls./year.

•

Ferroalloys: Pittsburgh Metallurgical Co. will expand ferroalloy production capacity at Calvert City, Ky., at a cost of $1 million.

No estimated date of completion has as yet been revealed.

•

Fertilizer: American Cyanamid Co. will build a 200,000-tons/year triple superphosphate plant at Brewster, Fla. Construction starts immediately; the plant is expected to be onstream by mid-'57.

•

Butadiene: Petroleum Chemicals, Inc., will expand its butadiene production capacity at Lake Charles, La., at a cost of $4.3 million.

When the additional production units go onstream, plant capacity will be 79,000 tons/year.

•

Methyl Ethyl Ketone: Shell Chemical Co. will build a 40-million-lbs./year methyl ethyl ketone plant at Norco, La.

Construction will start soon after the first of the year; completion is expected early in 1957.

Washington Angles »»

» **A broader drug market may be ahead** as a result of a new Food & Drug Administration action. The agency has okayed a special pediatric type of label for use, thus allowing prescription sale of drugs ordinarily considered too dangerous for pediatric use when sold over the counter. It's the first such special-use action that FDA has taken under the Durham-Humphrey amendment.

» **The part-time science teaching program** first proposed by Atomic Energy Commission chairman Lewis Strauss will be carried out by scientists and mathematicians at the U.S. Naval powder factory. The personnel will teach in Charles County, Md., schools.

» **Sale of the government's butadiene plant** will be pushed in Congress next year. The Louisville plant, now leased by Publicker, is the only one still owned by the government, but it isn't likely that the present commission charged with disposal of rubber producing facilities will accept this further sales job.

» **Do you have a good dispersing mechanism?** You can market it to the Army Chemical Corps, for possible wartime use in spreading nerve gases over a large area. Corps chief William Creasy, speaking to the Texas Chemical Council, said that it's "questionable" whether the Russians have come up with a mechanism better than the German nebelwerfer gas-dispersing device.

» **Want to sell 700,000 lbs.** of sodium orthosilicate? The New York Chemical Procurement District will accept bids on Jan. 13.

Future Expansion: Du Pont Co. has selected a 900-acre site near Maysville, Ky., "for possible future construction of a general-purpose chemical plant."

The site is located on the Ohio River, four miles west of Maysville, and some 64 miles east of Cincinnati.

•

Cellulose: Alaska Pine & Cellulose, Ltd., plans to spend an additional $6 million to expand its mill at Port Alice, B. C.

The expansion will double the plant's capacity, making it one of the world's largest cellulose installations.

COMPANIES . . .

Standard Oil Co. (Ind.) will call for redemption on Feb. 10, 1956, of $30 million in 30-year 3⅛% debentures, due Oct. 1, 1982.

The call will be at a redemption price of 103 and accrued interest to date of redemption.

•

Cutter Laboratories has concluded arrangements to purchase the assets to Haver-Glover Laboratories (Kansas City, Mo.).

The transaction involved both a cash transfer and a block of new 4½% convertible preferred Cutter stock.

•

Kennecott Copper Corp. has purchased the Butterfields Mines property of Combined Metals Reduction Co., involving some 3,800 acres just south of Kennecott's open pit copper mine at Bingham, Utah.

Purchase price: $1 million.

•

Polymer Corp., the government-owned rubber concern that Ottawa is periodically reported ready to sell to private industry, will apparently stay in the government's hands indefinitely.

Trade Minister Howe's statement last week—that consideration is being given to establishment of a butadiene plant in Alberta (*Business Newsletter, Dec. 17, p. 12*) drawing a minimum of 600,000 bbls./year of butane once Trans-Canada Pipe Line Ltd. gets Ottawa's natural gas project in operation—is regarded as evidence that any plans for disposing of the giant war-built plant have been shelved—at least for the present.

•

A transaction involving a 31,000-acre tract of prime timberland in Brantley and Wayne counties, Florida, was finalized last week.

The land has been purchased by Rayonier Inc., will provide timber for the company's plant in Jesup, Ga.

•

Atlas Plywood Corp. will offer to exchange one of its common shares for three shares of Plywood, Inc., common stock.

Complete acquisition of Plywood common would require about 73,000 Atlas shares in addition to the 759,005 shares now outstanding.

Stockholders of Eli Lilly & Co. have approved a three-for-one split in the company's common stock. Three shares of Class A $5-par voting common will be substituted for each share of the present no-par voting common, and three shares of Class B nonvoting $5 par stock for each present share of no-par nonvoting common.

•

Rich Pharmaceutical Corp. has filed a charter of incorporation in Dover, Del. Authorized capital stock: $1.25 million.

•

Koppers Co., Inc. has acquired the assets of Industrial Sound Control, Inc. (Hartford, Conn.), will operate the company as a department of its Metal Products Division.

•

Pabco Products Corp. has called a special stockholders' meeting for Jan. 9 to vote on the company's plan to acquire ownership of Fibreboard Products Corp. through purchase of Fibreboard stock now held by Crown Zellerbach Corp.

•

Due to continuing subnormal inflow in the Quebec watersheds, Aluminium Co. of Canada, Ltd., has been forced to further reduce aluminum production schedules.

Total production lost in 1956 because of drought conditions for all Quebec aluminum producers: 65,000 tons.

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BENHOFF: So that little unions won't be swallowed, he plans . . .

Merger for Defense

At chemical plants, oil refineries and other manufacturing works, the call is going out this week to independent and "one-plant" unions to band together for mutual defense.

Feeling uneasy because of the boisterous organizing plans announced by the newly merged AFL-CIO, the small and nonaffiliated unions are considering formation of a loose confederation that would bolster their ability to resist "raiding" and—at the same time—enhance their influence in the legislative and political arenas.

Masterminding this scheme in its early stages is Joel Blackmon, general counsel of Confederated Unions of America—a cooperative alliance of independent unions whose total claimed membership is only about 450,000. Sparking the merger movement in the oil and chemical fields is Baltimore's J. Henry Benhoff, who's maneuvering his International Petroleum & Chemical Workers toward marriage with Central States Petroleum Council.

No Central Control: Unification of Blackmon's group and the much larger—but equally loose-jointed—National Independent Union Council is likely to be mapped out at a February meeting in Washington, and Blackmon predicts that actual merger will follow later in the year—possibly in May.

NIUC is an association of about 2,500 local independent unions, and the U.S. Dept. of Labor estimates that the combined membership is 1.8 million.

Its officers—headed by Roger Rettig of St. Louis—met in that city last week with representatives of Confederated Unions of America to work out details for the organizing meeting in February.

As of now, the plan is to set up industrial panels within the merged organization to pool information of interest to member unions in each major industry. For example, there would be an oil panel to serve the locals that Benhoff is trying to link together.

Still In Cradle: Benhoff's association of local unions at installations of Standard Oil Co. (New Jersey) is still in its infancy. Membership went up last week with addition of a fifth local, representing employees at the Standard refinery in Charleston, S.C. While generally favorable to the proposed merger, Benhoff's members would prefer not to be too hasty on this matter, wanting to work out their own internal problems first. No. 1 item on their agenda: drafting a first set of wage policies, which may or may not parallel the current demands of Oil, Chemical & Atomic Workers Union (AFL-CIO).

One specific aim of the projected merger: putting pressure on the National Labor Relations Board to keep AFL-CIO unions from raiding the nonaffiliated locals.

Possible Consolidation

Another acquisition within the chemical process industries looms as a good possibility this week. The acquirer: General Tire & Rubber Co. (Akron); the acquiree: A. M. Byers Co. (Pittsburgh).

General's attraction to Byers is the latter company's fast-growing plastic pipe division, which would provide an ideal outlet for many General-produced plastics raw materials.

However, General's management says that, from their standpoint, there is only a 50-50 chance of the deal materializing.

From Byers' angle—in view of recent attempts to take over the company via stock purchases—acquisition by General Tire would be a welcome happenstance.

FOREIGN

Chemicals/South Africa: Production at the Union of South Africa's (Sasol's) oil-from-coal plant is proceeding on schedule this week, with gas consumption running at about 360 million gal./year.

Current annual output: 55 million gal. of gas, 10,000 tons of ammonium sulfate, 1 million gal. of creosote, 45 million cu. ft. of liquid oxygen, and 100,000 gal. of tar acids.

•

Fertilizer/Southern Rhodesia: African Explosives and Chemical Industries will start construction of a superphosphate plant near Salisbury, Southern Rhodesia, soon after the first of the year.

Cost: over £3 million; estimated date of completion: 1958.

•

Aluminum/French Cameroons: First production from a new aluminum plant (jointly owned by Pechiney and Ugine) is expected late in 1956. Capacity (when the plant is in full operation): 45,000 metric tons/year.

•

Carbon Black/France: Societe Cabot France (the French subsidiary of Godfrey L. Cabot) will bring a new carbon black plant near Marseilles on-stream early in 1957.

At present, French annual imports of carbon black run between 35,000-40,000 metric tons.

•

Fertilizer/India: India plans to use the nitrogen by-product of a Krupp-built steel plant (being built at Rourkela, India) in making fertilizer.

Production potential has not yet been calculated, but government officials feel that the fertilizer thereby turned out will "materially improve" India's current annual production of 120,000 tons.

•

Polyesters/West Germany: The German companies Wasag-Chemie, A.G., and its subsidiary, Rheinische Gummi- und Celluloid-Fabrik, have joined with Celatino, S.A., of Panama (a subsidiary of Celanese Corp. of America) to found a new firm—Polyester, GmbH, in Mannheim.

Initial capitalization: $150,000; production plans include immediate construction of polyester production facilities in West Germany.

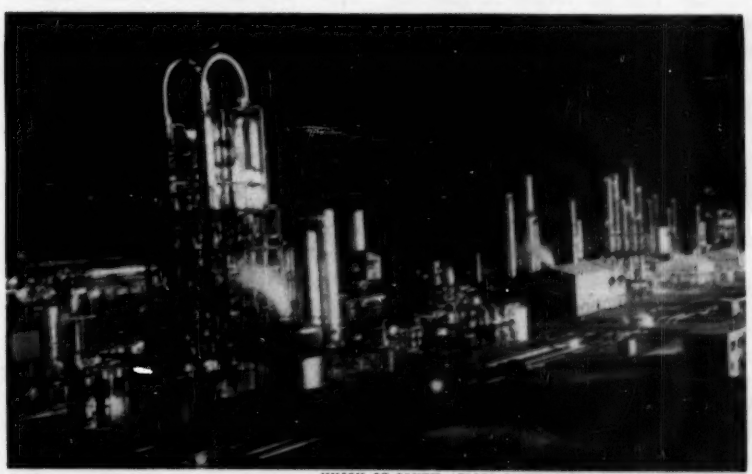
•

Expansion/West Germany: Farbenfabriken Hoechst has acquired the assets of Anorgana GmbH in Gendorf, Bavaria—originally the property of the Bavarian State, and later the property of a bank consortium.

Anorgana's production facilities, for various plastic raw materials, will be operated intact by Hoechst.

Hoechst has also concluded an agreement with Rheinpreussen A.G. fuer Bergbau und Chemie—under terms of which Hoechst will handle production, distribution and patent rights of all Rheinpreussen pharmaceuticals.

Reason given for Rheinpreussen's virtual withdrawal from the pharmaceutical field: the growing domestic and foreign competition for pharmaceuticals in West Germany.



UNION OF SOUTH AFRICA GOVERNMENT INFORMATION OFFICE

SASOL: Production at the $85-million plant is proceeding on schedule.

keeping up with

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BUSINESS & INDUSTRY. . . . . .

WIDE WORLD

JUDGE KAUFMAN: For ex-governmental attorneys, emancipation.

LEGAL. . . . . .

Lawyers' Unshackling: For corporation lawyers who formerly worked for the U.S. government, the recent ruling by Federal Judge Irving Kaufman in the government's $45-million suit against Esso Export Corp. means more freedom to practice. Specifically, Kaufman held that attorney Garfield Horn of the firm of Sullivan & Cromwell can represent Esso Export and its parent company—Standard Oil of New Jersey—even though he worked from 1949 to '51 for the agency that bought the crude oil for which the government allegedly was overcharged. In making this ruling, the judge indicated that in a situation like this, the burden of proof is on the government to show that the lawyer in question had had access to key documents and confidential material, and that the lawyer had given advice on the issue in dispute.

•

State Laws Assailed: Present and proposed state laws are under attack by chemical industry people in Pennsylvania and Illinois this week:

• In Illinois, a number of industrial concerns have filed lawsuits challenging the legality of the state use tax and asking recovery of payments already made under that law. National Petro-Chemicals Corp., for example, wants a $2,765 refund.

• Chemical and pharmaceutical companies, chemical engineers and pharmacists, are among the groups opposing enactment of a Pennsylvania legislative measure that would transfer all professional licensing authority from the state's Dept. of Public Instruction to its Dept. of State. Most professional groups want the present system continued, but the administration of Gov. George Leader is backing the bill because the Dept. of Public Instruction "has full-time responsibility for public education and shouldn't be charged with nonrelated duties."

•

McKesson Suit Appealed: The U.S. Supreme Court has agreed to hear arguments on a third antitrust suit that had been filed under the Truman Administration, dismissed by a district court, and then appealed by the now Republican-controlled Dept. of Justice.

Latest in this series is the 1952 action against McKesson & Robbins. Earlier this year, Federal Judge John Clancy in New York threw out the government's contention that M&R—a manufacturing concern that also does some of its own wholesaling—was violating the Sherman antitrust law when it set "fair trade" price schedules for other wholesalers. In asking the Supreme Court to reverse the lower court's dismissal, the Justice Dept. asserts that M&R's resale agreements "eliminate price competition between persons at the same distributive level."

LABOR. . . . . .

Dime Wage Boosts: As 1955 was winding up its affairs with chemical wage rates at their all-time highest level, new contracts continued to mention 10¢/hour as a favorite increment. Of 15 recent agreements summarized last week, pay increases ranged from 6¢ to 15¢/hour, with most in the 7-10¢ bracket.

•

Employees' Lawsuits: Two chemical process companies have had to face civil actions for personal injuries—one suit filed by an employee, the other by a contractor's employee:

• At Knoxville, a settlement of $75,000—said to be the largest personal injury settlement ever made in Tennessee—goes to 26-year-old John William Henderson, who was injured by a chemical tank explosion last June at the Oak Ridge atomic installation

operated for the government by Union Carbide Nuclear Co. Henderson was working for a contractor at the time.

• Two weeks later, also at Knoxville, Aluminum Co. of America employee Ben Miller filed suit against Alcoa for $25,000. Miller says he was injured last February when the auto in which he was riding to work was struck by an Alcoa locomotive.

•

Raiders Repulsed: District 50 of the United Mine Workers has had some success in picking up disaffected locals of International Chemical Workers Union (AFL-CIO) since ICWU was hit by internal dissension in 1954, and it appears that there'll continue to be bad blood between these two unions for many months to come. But in their latest collision, ICWU came out on top. This was out at Long Beach, Calif., where District 50 sought to take over ICWU Local No. 1 at Mastic Tile Corp. ICWU easily won the National Labor Relations Board election.

KEY CHANGES. . .

John H. Weeks, to vice-president, The Glidden Co. (Cleveland).

Eugene E. Stone III, to director, and **E. H. Kittredge Jr.,** to vice-president, Texize Chemicals, Inc. (Greenville, S.C.).

Robert I. Wishnick, to board chairman, **Max A. Minnig,** to president, and **William Wishnick,** to executive vice-president, Witco Chemical Co. (New York).

Walter G. Andrews, to assistant general sales manager, Archer-Daniels-Midland Co. (Minneapolis).

Alex Oblad, to director and vice-president, and **Jack C. Dart,** to vice-president, Houdry Process Corp. (Philadelphia).

Leslie E. Simon, to director, Research and Development Division, The Carborundum Co. (Niagara Falls, N.Y.).

H. Seymour Colton, to president, Macco Chemical Co. (Wickliffe, O.).

E. B. Suydam, to president, Linde Air Products Co. (New York).

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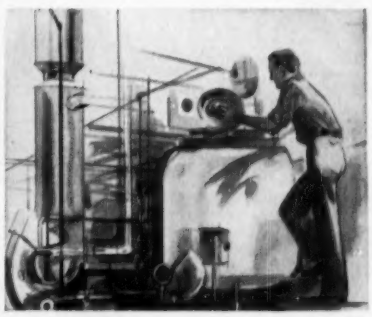

Solubility Factor Good

Solubility is 19.3 grams/100 grams water. Other solvents are water-methanol mixtures, in which solubility ranges from 13.0 grams/100 grams solvent for a ratio of 4 to 1 water-methanol solution down to 0.7 grams/100 grams solvent for methanol alone. It also dissolves in other water-alcohol mixtures, and liquid ammonia. In general, solubility sharply decreases with higher alcohols. KBH_4 is generally insoluble in esters, ethers, and hydrocarbons. It has a negative heat of solution in water of 6.3 Kcal/mol.

KBH_4 is Stable

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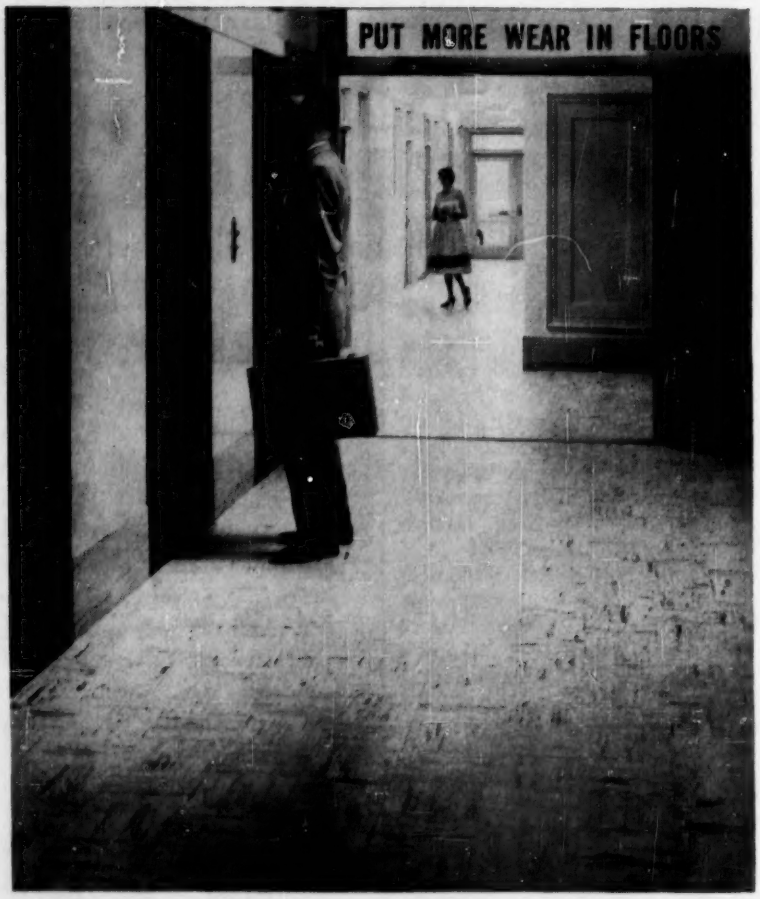
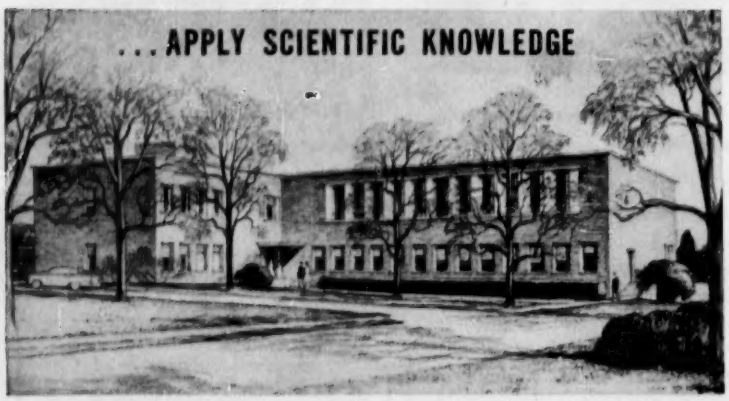
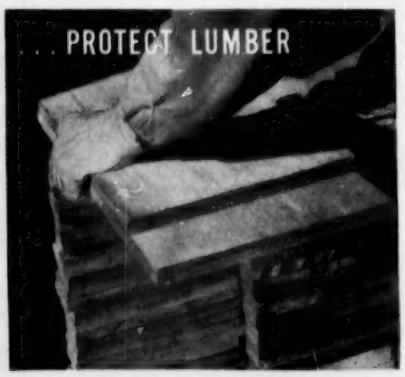


IN HEAVY TRAFFIC AREAS like this, floor tiles must be built to take a beating. Whether the tiles are of the rigid, mastic type or flexible flooring based on rubber or vinyl, Hercules Neolyn®, Mastolyn® or Staybelite® resin can contribute to lower processing costs and better wearing qualities. The wide variety of properties offered by these resins assures that there is one best suited for every floor tile formulation.



◆ **MORE THAN 17,000 VOLUMES** of scientific literature and tens of thousands of company research reports will be housed in this new $1,000,000 Technical Information Center at the Hercules Experiment Station near Wilmington. In addition, the structure will provide quarters for the many technical specialists who serve the scientific information needs of the Hercules research staff—making the Center one of the nation's most complete information services to an industrial research organization.

WHICH HAD THE TREATMENT? The clean, unsplintered piece has been treated with Hercules Paracol® wax emulsion, making it possible to use every inch of lumber that has been pre-cut at the mill. The untreated piece (top) is badly "checked" and a portion of the end must be discarded before it will be suitable for use. ◆



080-13

HERCULES POWDER COMPANY
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SYNTHETIC RESINS, CELLULOSE PRODUCTS, CHEMICAL COTTON, TERPENE CHEMICALS, ROSIN AND ROSIN DERIVATIVES, CHLORINATED PRODUCTS, OXYCHEMICALS, EXPLOSIVES, AND OTHER CHEMICAL PROCESSING MATERIALS.

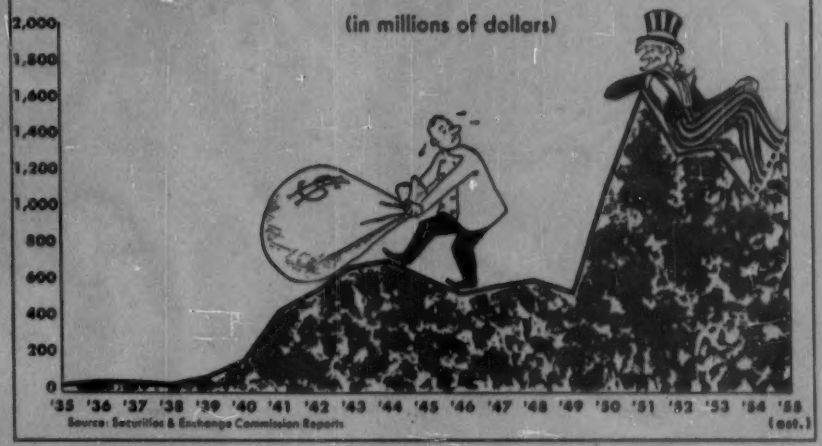
HERCULES

CHEMICAL MATERIALS FOR INDUSTRY

Charting Business

CHEMICAL WEEK
December 31, 1955

CHEMICAL COMPANIES' FEDERAL TAX LOAD GETS HEAVIER AGAIN



DESPITE a rising chorus of protests, there's very little chance, in the minds of Washington observers, that the 52% corporate tax rate will be reduced in the next session of Congress (*see Forecast, p. 39*).

Chief reason: a reduction (to 50%) would cost the Treasury upwards of $1 billion. Also, both Democratic and Republican party leaders would prefer in an election year to give whatever tax cuts are possible to individual income taxpayers, rather than to corporations, which don't vote.

DESPITE GAINS MADE BY SYNTHETICS, KING COTTON STILL REIGNS SUPREME

Here's a Recent Comparison of U. S. Textile Mill Consumption:

	1920		1955 (estimated)	
	Millions of lbs.	Percent of Market	Millions of lbs.	Percent of Market
Cotton	2,828.1	88.9	4,000.0	68.0
Wool	314.2	9.9	380.0	6.5
Silk	29.2	0.9	7.0	0.1
Rayon and Acetate	8.7	0.3	1,140.0	19.4
Other Synthetics	0.0	0.0	353.0	6.0
Total	3,180.2	100.0	5,880.0	100.0

AS 1955 draws to a close, textile men agree that synthetics are driving an ever-widening wedge into the fiber market. Whereas their percentage cut of the market in 1920 was 0.3%, today that percentage is estimated at 25.4%. And by the end of '56, the total may well have risen above 30% of textile fibers.

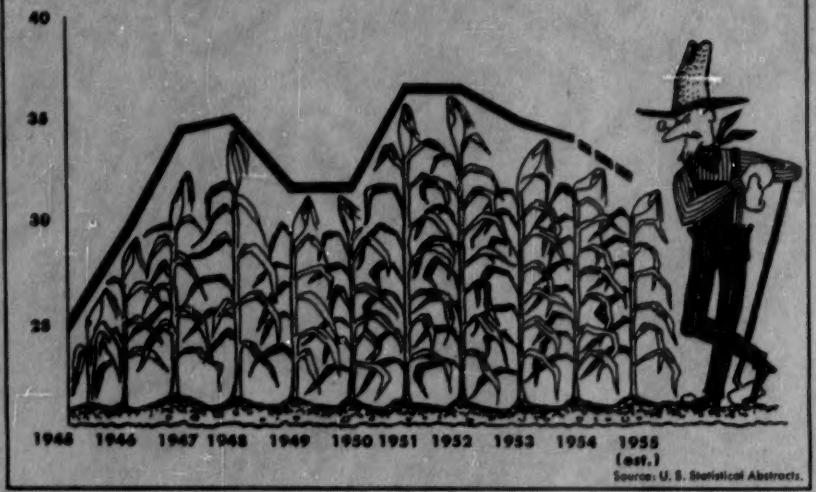
Biggest gain among man-made fibers so far has been made by rayon staple. But in the years immediately ahead, other synthetics could well bound past rayon, come close to challenging cotton's supremacy.

Charting Business

(Continued)

GROSS FARM INCOME CONTINUES TO SLUMP

(in billions of dollars)



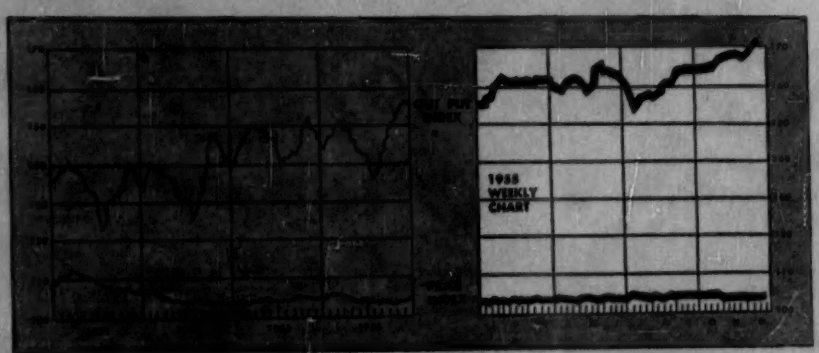
Source: U. S. Statistical Abstracts.

GROSS farm income (with its obvious direct effect on purchases of agricultural chemicals) will continue to fall off in 1956.

The chief reasons: the additional acreage restrictions that are due to be placed on farmers next year, and slightly lower prices for farm produce.

Secy. of Agriculture Ezra Taft Benson is convinced, however, that the decline will come to an end toward the close of 1956, and that by 1957, farmers will once again be able to purchase their full requirements of ag chemicals.

BUSINESS INDICATORS



WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	173.1	172.0	155.7
Chemical Week Wholesale Price Index (1947=100)	104.7	104.7	104.3
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	470.0 est.	473.7	358.0

MONTHLY — Production (Index 1947-49=100)	Latest Month	Preceding Month	Year Ago
All Manufacturing and Mining	146	147	130
All Chemical Products	176	176	156
Industrial Chemicals	192	192	164

FAMOUS LIGHTHOUSES OF AMERICA

BARNEGAT LIGHT is located on Island Beach at the south side of the entrance to Barnegat Inlet, New Jersey. For more than a century its beacon has been a familiar course-marker to all craft traveling the steamer lanes off the Jersey coast. The first lighthouse, built in 1835, was leveled by a pounding Atlantic. The present tower, 161 feet high and made of brick, was completed in 1858, 900 feet south of the original structure. The tower itself is now owned by the State of New Jersey but the light is maintained by the U. S. Coast Guard.

Lighting Ways to Progress and steady growth in the field of electrochemicals is the Niagara Alkali Company—a pioneer in the development, production and use of these important products. Rely on Niagara for uniformly high quality in Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI COMPANY

60 East 42nd Street

New York 17, N.Y.

St. Regis Announces— New "Structural Strip"

The first real structural change in Multiwalls in 25 years

STRENGTH where it is needed most, combined with lower cost, are provided by a new principle of multiwall bag construction developed by St. Regis Paper Company. Structural strips are used to reinforce the gusset areas and the edges of bags, where the greatest stress occurs.

Reinforcing the gusset areas is accomplished by placing structural strips of kraft paper between two walls of heavy duty multiwall bags. Thus far, this principle has been applied commercially only to multiwall bags of five and six ply construction. For a bag comparable to a five-ply bag, one structural strip is placed in each gusset of a four-ply bag, thereby reducing the amount of paper used in the package with no sacrifice of performance and at a saving. The same end results are obtained for a bag comparable to a six-ply bag by adding one set of structural strips in a five-ply bag.

The savings possible are indicated by the fact that reducing the amount of paper required can result in savings of from 5-15% of the cost of the bag.

Laboratory and field tests have proved the effectiveness of the application of structural strips in bags of five and six ply construction. These tests are being continued with a wide range of other sizes and constructions of multiwall bags to broaden the application of structural strips to these as well. The results of these tests indicate that it may also be possible to increase the strength of multiwall bags of minimum basis weight construction by adding structural strips at only slight additional cost.

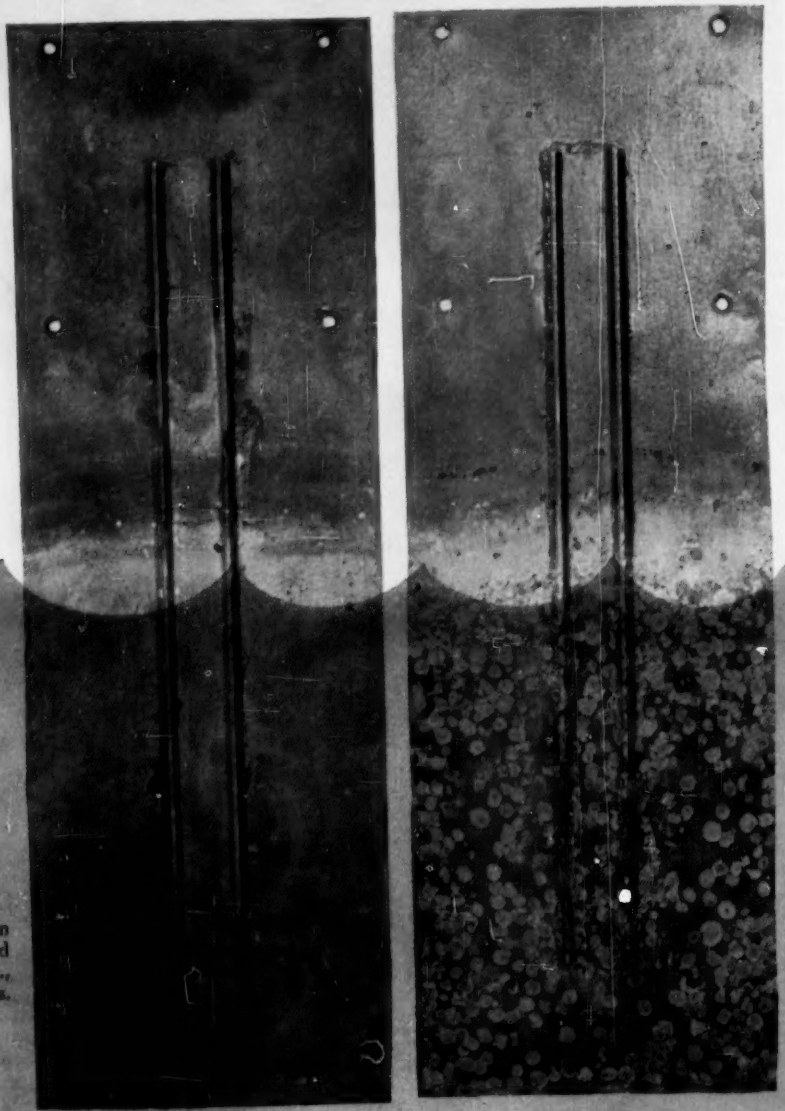
At present, multiwall bags with structural strips are being field tested with a wide range of products. (*Illustration at the right shows the principle of the structural strip*). Developed by the Multiwall Packaging Division, St. Regis Paper Company, 230 Park Avenue, New York 17, N. Y.

Advertisement

ST REGIS NEW
STRUCTURAL
STRIP
Another development by the men
behind The Man from St. Regis to bring you
Better Bags and Lower Packaging Costs.

TESTS PROVE it pays to use coatings formulated with BAKELITE resins

salt water tests prove coating's superiority



Coatings used in this test are based on BAKELITE Vinyl Resins and formulated by **Briner Paint Mfg. Co., Inc.**, Corpus Christi, Texas.

These test panels were taken from a floating test rack in Corpus Christi Bay after 9 months of exposure. The lower portions were continually submerged in sea water, while the upper areas were alternately wet and dried by a 12 to 18 mile per hour wind. The panel on the right, coated with conventional marine bottom paint, became heavily encrusted with marine growths. The panel on the left, virtually free of any organisms, is protected with coatings based on BAKELITE Brand Vinyl Resins.

These tests, and hundreds others, show that there are large savings in increased service life and reduced maintenance costs with coatings based on BAKELITE Resins. Properly applied, experience shows that they are tough, durable and tenacious, resisting acids, alkalies, weather and temperature extremes and other destructive agents.

Whatever your problem in protective coatings for equipment, packaging, buildings or products, rely on coatings based on BAKELITE Brand Resins. For names of suppliers, and a free copy of our booklet, "BAKELITE Resin Coatings for the Chemical Industry," write Dept. LV-34.

BAKELITE BRAND **Vinyl Resins**

Vinyl, Phenolic and Epoxy Resins, and Styrene and Vinyl Acetate Latices for Coatings

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 E. 42nd St., New York 17, N. Y.

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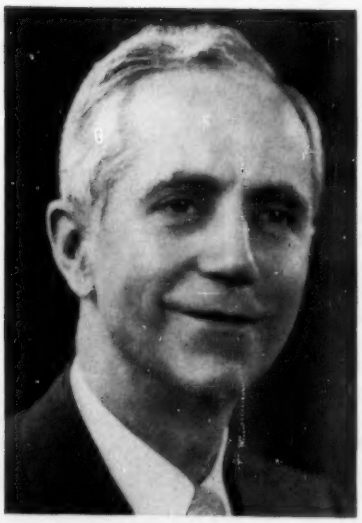
Forecast for '56

In the words of the men who know best—the chemical industries' top executives—1956 will be a year of almost unparalleled prosperity. But the year will not be without challenges. Taxes, manpower, foreign competition, and sales problems will make 1956 a period both stimulating to the intellect and demanding of the finest in management talents.



"THE chemical industry in 1956 seems certain to continue its healthy growth in new construction, new processes, new products, greater sales volume and larger earnings. Profitable new markets are resulting from population growth, from replacement of natural substances with made-for-the-job chemical end-products, and from higher standards of living. However, industrialists should certainly keep aware of the intrusion of additional stifling government controls over business, the double taxation of dividends, and the retardation of investment of risk capital by the present tax structure.

"A substantial amount of chemical growth can be assured by insistence on rapid construction of an adequate highway system, not alone because of the money thus circulated and the chemicals thus consumed, but because of the resulting cheaper transportation and continued growth of the automotive, rubber, petroleum and allied industries."

Ross W. Thomas
Vice-president
Research and Development
Phillips Petroleum Co.

"MAJOR expansion of plant capacity in 1955 and spending plans for 1956 indicate that the chemical industry is counting on continued production growth. But it is axiomatic that nothing moves until something is sold. This means that sales and market development will be more important functions than ever before.

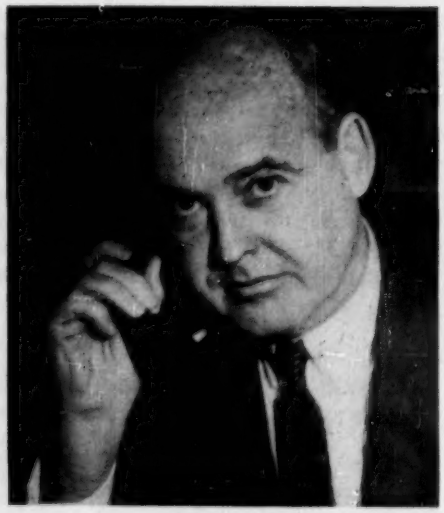
"We hear a lot about the chemical industry's need for competent personnel. This applies particularly to sales personnel. Chemical sales representatives are not just order-takers. They must be technically trained and production wise, as well as hard hitting.

"We need to look at our sales personnel not as so many troops in battle for survival, but as essential manpower in fully developing the chemical growth potentials that still lie ahead.

"Chemical executives have a real marketing job to do if we are going to make good our pledge of a better America through chemical progress."

Ralph K. Gottshall
President
Atlas Powder Co.

Forecast for '56



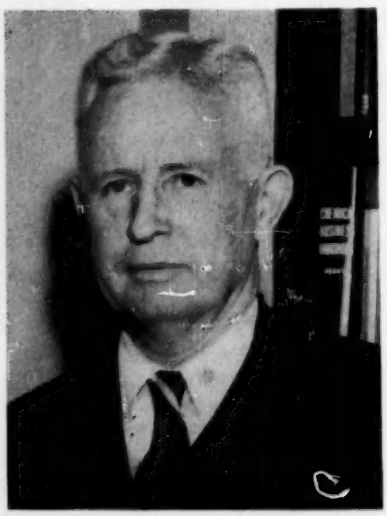
"THE so-called 'chemical' industry of today is a complex industry, becoming more and more embraced by other industries. Where does the 'chemical' industry begin and where does it end? There exists a challenge to more accurately define its scope and to forecast its future with more restraint than has been evidenced in the recent past. Above all, there is an open challenge for these 'chemical' groups to develop a code of ethics conforming to high standards of business and professional conduct."

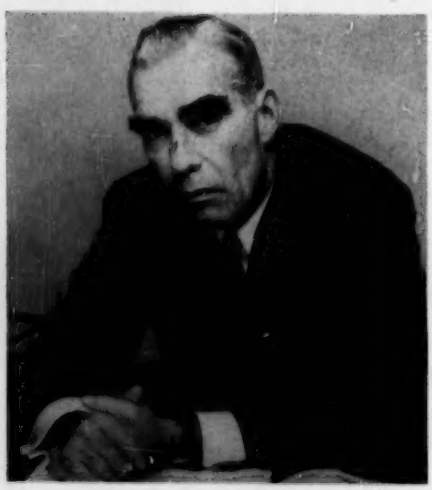
Thomas S. Nichols,
President
Olin Mathieson Chemical Corp.

"NEW plant construction is continuing at a very high rate and is sure to intensify present keen competition. It is essential that management in the chemical industry do everything possible to be sure its house is in order from the standpoint of costs and efficiency in production, selling and research. This is the way that management can best provide security of employment and opportunity for its employees.

"I am greatly concerned about the inadequate supply of properly qualified technically trained personnel, and I am heartily in favor of the efforts being made by our fine technical societies and the MCA and other organizations to increase high school enrollment in the sciences. This is of vital importance to our future national security."

R. L. Murray
Chairman of the Board
Hooker Electrochemical Co.





"I LOOK for the chemical industry to continue to extend its dynamic growth during 1956. Shortages of skilled manpower and basic materials, such as certain types of steel, may curb expansion somewhat. However, the demand for new chemical products, the discovery and development of new uses for present products, and the increasing needs of a virile and expanding economy cannot and will not be denied."

Vincent H. Shea,
President
Shea Chemical Corp.

"THE total demand for industrial and heavy chemicals will remain strong within the coming year. I believe that our industry will maintain basically its present level, and remain at the high plateau that has now been reached.

"In this continued chemical prosperity, we can expect that new products will continue to be developed and put onstream at a rate at least comparable to the present. These new products will undoubtedly make for increased competition even within the current high level of markets. This will have the effect of toughening competition within many fields of chemical industry, as new products compete with established ones for the consumer's dollar."

Ernest Hart
Executive Vice-President
Chemicals Divisions
Food Machinery & Chemical Corp.

"I THINK the outlook for both gross sales and net profits in 1956 is such that the levels of 1955 should certainly at least be maintained. For one thing, there is a continuing healthy demand for basic chemicals, and a still-strong growth trend among the principal companies using them. This demand for established commodities, coupled with expanding uses for the intriguing new chemicals just emerging from research laboratories, should overbalance any depressing effects from too-rapid credit expansion and overproduction in some lines.

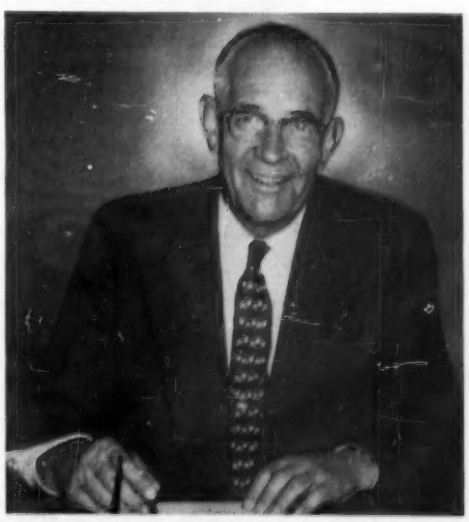
"Regardless, however, of what may be in store for 1956, the long-range picture for the chemical industry is bright—both because of the indicated population growth over the coming decades and because management in general is engaging its effort to cope with its challenges."

Peter Colefax
President
American Potash & Chemical Corp.

"I EXPECT the farmer to place more emphasis on buying products where the seller can give on-the-spot know-how, rather than on buying on just price. With the Miller bill in full force, pesticides will assume a more highly complex nature. So, the farmer will have to look for technical support and quality products from the chemical industry to produce marketable crops. Furthermore, many farmers are caught in a price squeeze affecting farm income, which will in turn affect farm credit, crop payment terms and actual chemical usage. The opportunity of the industry in 1956 is to show the farmer how to reduce costs, improve quality and increase profits through use of chemicals.

"Bearing this opportunity in mind, executives in the agricultural chemical industry can expect increased sales and profits in 1956 over 1955—which itself was a good year."

Art Mohr
President
California Spray-Chemical Corp.



Expansion Checklist for '56

Chemical companies, in 1956, will bring onstream one of the most imposing lists of new facilities in the nation's history.

Here, Chemical Week lists all facilities now due to be completed within the continental limits of the U.S. during the next 12 months, valued at over $100,000.

Listings were submitted by chemical and allied process companies in response to a nationwide survey conducted in Nov. '55.

Acetylene

Standard Ore and Alloy Corp.

Location: Natchez, Miss.; cost: $20 million; capacity: 30,000 tons/year of acetylene, 60,000 tons/year of ammonia and various vinyl derivatives.

Alcohols, organic acids, aldehydes

Hidalgo Chemical Co.

Location: Brownsville, Tex.; cost: 20 million; capacity: 125 million lbs./year.

Alum (liquid)

Allied Chemical & Dye Corp., General Chemical Division

Location: Hopewell, Va.; due in: April '56.

Aluminum

Aluminum Co. of America

Location: Port Lavaca, Point Comfort and Rockdale, Tex.; cost: $35 million; due in: second quarter '56.

Harvey Aluminum Co.

Location: The Dalles, Ore.; cost: $35 million; capacity: 54,000 tons/year.

Kaiser Aluminum & Chemical Co.

Location: Gramercy, La.; cost: $60 million.

Olin Mathieson Chemical Corp.

Location: Upper Ohio River Valley; cost: $75 million; capacity: 60,000 tons/year.

Revere Copper & Brass Co., Inc.

Location: Wenatchee, Wash.; capacity: 60,000 tons/year; cost: $53 million.

Reynolds Metals Co.

Location: Ohio River Valley; capacity: 200 million lbs./year; cost: $168.5 million.

Location: Sheffield, Ala.; capacity: 50 million lbs./year; due in: '56.

Location: Texas; capacity: 20 million lbs/year; due in: '56.

St. Joseph Lead & Pittsburgh Consolidated Coal

Location: Josephtown, Pa.; capacity: 66,000 tons/year; cost: $85 million.

Ammonia

Atlas Powder Co.

Location: undecided; cost: $6 million.

Calumet Nitrogen Products Co.

Location: Hammond, Ind.; capacity: 300 tons/day of anhydrous ammonia, 200 tons/day of nitrogen solutions; due in: midsummer '56; cost: $9 million.

Chillicothe Chemicals, Inc.

Location: Chillicothe, Tex.; capacity: 180 tons/day of ammonia; 160 tons/day of urea; cost: $17 million.

Columbia River Chemicals Co.

Location: Attalia, Wash; capacity: 160 tons/day of ammonia, 110 tons/day of urea, 140 tons/day of ammonium sulfate; cost: $12 million.

Consolidated Mining & Smelting Co.

Location: St. Helens, Ore.; cost: $20 million.

Escambia Bay Chemical Co.

Location: Pensacola, Fla.; capacity: 250 tons/day of ammonia, 220 tons/day of nitric acid, 300 tons/day of ammonium nitrate; cost: $26 million.

Ketona Chemicals, Inc.

Location: Tarrant, Ala.; capacity: 45,000 tons/year of nitrogen solutions.

National Farmers Union Resources Corp.

Location: Sunpete County, Utah; cost: $12 million; capacity: 125 tons/day.

Northern Chemical Industries Inc.

Location: Searsport, Maine; capacity: 43,000 tons/year; cost: $9 million; due in: first quarter '56.

Phillips Pacific Chemical Co.

Location: Pasco, Wash; capacity: 200 tons/day; cost: $12 million.

Southern Nitrogen Co., Inc.

Location: Savannah, Ga.; cost: $14 million; capacity: 250 tons/day; due in: late '56.

Southwest Agrochemical Corp.

Location: Phoenix, Ariz.; capacity: 100 tons/day; cost; $2.5 million.

St. Paul Ammonia Products Co.

Location: Pine Bend, Minn.; capacity: 200 tons/day of ammonia and nitrates; cost: $15 million.

Standard Oil Co. (Calif.)

Location: Richmond, Calif.; capacity: 300 tons/year; cost: $16 million.

Sun Oil Co.

Location; Marcus Hook, Pa.; capacity: 300 tons/day; cost: $9 million.

Thunderbird Corp.

Location: Kyrene, Ariz.; capacity: 120 tons/day of ammonia; 45 tons/day of urea; 170 tons/day of sulfuric acid; cost: $13 million; due in: summer '56.

Umbaugh Chemicals Inc.

Location: Walsenburg, Colo.; capacity: 120 tons ammonia, 120 tons phosphoric acid, 150 tons ammonium sulfate/phosphate/daily.

U.S. Industrial Chemicals Co. Division, National Distillers Products Corp.

Will expand current facilities 25,000 tons/year; due in: mid-'56.

U.S. Steel Corp.

Location: Geneva, Utah; capacity: 76,000 tons/year; cost: $18.5 million; due in: mid-'56.

Ammonium bicarbonate

Allied Chemical & Dye Corp., Solvay Process Division

Location: Syracuse, N. Y.; capacity: increased 25%; due in: Jan. '56.

Ammonium phosphate solutions

Brea Chemicals, Inc.

Location: Browley, Calif.; capacity: 25,000 tons/year.

Aniline

Allied Chemical & Dye Corp., National Aniline Division

Location: Moundsville, W. Va.; double present capacity; due in: May '56.

Anti-oxidants

B. F. Goodrich Chemical Co.

Location: Akron, O.; cost: $100,000.

Automotive chemicals

Grin Chemical Corp.

Location: Seattle, Wash.; cost: $500,000.

Aviation alkylates, butylenes, butadiene

Texas Butadiene & Chemical Corp.

Location: San Jacinto River, Houston, Tex.; cost: $26 million; capacity: either 17,000 tons/year of butadiene plus 2.5 millions barrels of aviation gasoline, or 43,000 tons/year of butadiene with no aviation gasoline.

Barium carbonate

Barium & Chemicals, Inc.

Location: Painesville, O.

Bisphenol

Shell Chemical Corp.

Location: Houston, Tex.; due in: March '56.

Bromine

Murphy Corp. and Michigan Chemical Co.

Location: El Dorado, Ark.

Calcium chloride

Columbia-Southern Chemical Corp.

Location: Le Moyne, Ala.; capacity: will triple current capacity.

Carbon black

Lynn Carbon Black Co.

Location: San Angelo, Tex.; engineering pilot plant; due in: spring '56.

Phillips Chemical Co.

Location: Borger, Tex.

Witco Chemical Co.

Location: Eunice, N. M.; capacity: 25 million lbs./year.

Carbon bisulfide

Stauffer Chemical Co.

Location: Le Moyne, Ala.; due in: Aug. '56.

Expansion Checklist for '56

Cellophane

Olin Mathieson Chemical Corp.

Location: Olin, Ind.; 33 million lbs./year; due in: late '56.

Cellulose

Rayonier Inc.

Capacity: 100,000 tons/year; cost: $30 million.
Location: Jesup, Ga.

Cellulose propionate

Celanese Corp. of America

Location: Belvedere, N. J.; cost: $1.5-million; due in: Jan. '56.

Cement

Alpha Portland Cement Co.

Location: St. Louis, Mo.; capacity: 2.5 million bbls./year.

Consolidated Cement Co.

Location: Paulding, O.; capacity: 1.25 million bbls./year; due in: fall '56.

General Portland Cement Co.

Location: Chattanooga, Tenn.; cost: $1.5 million.
Location: Fort Worth, Tex.; capacity: 1.25 million bbls./year.

Ideal Cement Co.

Locations: new plants at Houston, Tex.; Ada, Okla.; Trident, Mont.; Superior, Neb.; expansion of current capacity at Redwood City, Calif.; Mobile, Ala.; Boettcher, Colo.; Baton Rouge, La.; Okay, Ark.; New Orleans, La.; cost: $55 million; capacity: 31 million bbls./year.

Lone Star Cement Corp.

Location: Lake Charles, La.; capacity: 2 million bbls./year.

Marquette Cement Co.

Location: Milwaukee, Wis.; cost: $7 million; capacity: 1.25 million bbls./year; due in: late '56.
Location: Cape Girardeau, Md.; capacity: 1.2 million bbls./year; due in: late '56.
Location: Des Moines, Ia.; capacity: 500,000 bbls./year; due in: late '56.

Missouri Portland Cement Co.

Location: St. Louis, Mo.; capacity: 5 million bbls./year.

Peerless Cement Corp.

Location: Detroit; capacity: over 1 million bbls./year; due in: late '56; cost: $7 million.

Permanent Cement Co.

Location: Victorville, Calif.; capacity: 2 million bbls./year; cost: $21 million; due in: fall '56.

Char products

Cotarco, Inc.

Location: Denver, Colo.; capacity: 5,930 tons/day of char products, 67 tons/day of sulfur.

Chlorine

Allied Chemical & Dye Corp., Solvay Process Division

Location: Brunswick, Ga.; capacity: 100 tons of chlorine, 120 tons of caustic daily; due in: Dec. '56.

Columbia-Southern Chemical Corp.

Location: Lake Charles, La.; due in: June '56.
Location: Barberton, Ohio; due in: Dec. '56.

Chlorine, caustic soda

Union Chemical & Materials Corp.

Will increase capacity of two subsidiaries (Frontier Chemical Co. and Consumers Co.), Wichita, Kan.; cost: $8 million; Frontier will add 120 tons/day; due in: March.

General Aniline & Film Corp.

Location: Linden, N. J.; capacity: 50 tons/day; due in: first quarter '56.

Weyerhauser Timber Co.

Location: Longview, Wash.; capacity; 100 tons/day of chlorine.

Chromite

Mineral Sands Co.

Location: Bandon, Ore.; cost: $3 million; capacity: 200 tons/day; due in: early 1956.

Chromium plating compounds

Metal & Thermit Corp.

Location: East Chicago, Ind.; cost: $40,000; due in: March '56.

Coking by-products

American Gilsonite Co.

Location: Fruita, Colo.; cost: $10 million.

Inland Steel Co.

Location: Indiana Harbor, Ind.; capacity: 445,000 tons/year of coke; cost: multimillion dollars; due in: July '56.

U.S. Pipe & Foundry Co.

Capacity: 3,500 tons/day of coke.

Youngstown Sheet & Tube

Location: Youngstown, O.; cost: $8.2 million.

Cracking catalysts

Davison Chemical Division of W. R. Grace & Co.

Location: Curtis Bay, Md.; cost: $4 million; due in: April '56; capacity: 60 million lbs./year.

Cyclohexanol (refined)

Allied Chemical & Dye Corp., National Aniline Division

Location: Hopewell, Va.; capacity: several million lbs.; due in: Oct. '56.

Detergents, emulsifiers

Ninol Laboratories, Inc.

Location: Chicago, Ill.; cost: $250,000; capacity: 10 million lbs./year.

Diallyl phthalate prepolymer

Food Machinery & Chemical Corp. (Ohio-Apex)

Location: Nitro, W. Va.; due in: first quarter '56.

Diisocyanates

Allied Chemical & Dye Corp., National Aniline Division

Location: Moundsville, W. Va.; due in: mid '56.

Du Pont Co.

Location: Deepwater Point, N. J.; due in: July '56.

Mobay Chemical Co.

Location: New Martinsville, W. Va.; capacity: several hundred tons/month.

Dimethyl sulfoxide

Stepan Chemical Co.

Location: Joliet, Ill.; cost: $250,000; due in: early '56; capacity: 1-2 million lbs./year.

Dynamite

Hercules Powder Co.

Location: Bacchus, Utah; cost: $2 million.

Ethanolamine

Olin Mathieson Chemical Corp.

Location: Brandenburg, Ky.; due in: Jan. '56.

Ethyl chloride

Ethyl Corp.

Location: Baton Rouge, La.; cost: $4 million.

Ethylene

Monsanto Chemical Co.

Location: Texas City, Tex.; a 150% increase in capacity.

Petro-Tex Chemical Corp.

Location: Houston, Tex.; a 50% increase in capacity to 155,000 tons/year; due in: late '56.

Phillips Chemical Co.

Location: Sweeny, Tex.; capacity: 145 million tons/year; due in: Dec. '56.

Ethylene oxide

Carbide and Carbon Chemicals Co. (division of Union Carbide and Carbon Co.)

Location: Torrence, Calif.; due in: early '56.

Fatty acid amides

Stepan Chemical Co.

Location: Joliet, Ill.; capacity: 2 million lbs./year.

Fertilizers

California Spray-Chemical Co.

Richmond, Calif.

Davison Chemical Co. Division of W. R. Grace & Co.

Location: Wakarusa, Ind.; due in: March '56.

Delta Gas Chem. Corp.

Location: Buras, La.; cost: $8.8 million.

Grange League Federation

Location: Big Flats, N. Y.; capacity: 300,000 tons/year; cost: $800,000.

Green Belt Chemical Co.

Location: northern Ohio.

Pennsylvania Salt Manufacturing Co.

Location: Paulsboro, N. J.; due in: early '56.

Stauffer Chemical Co.

Location: Vernon, Calif.; cost: $750,000.

Swift & Co.

Location: Pompano Beach, Fla.; due in: Sept. '56.
Location: St. Joseph, Mo.; due in: Dec. '56.

Virginia-Carolina Chemical Corp.

Will bring three new plants into operation in late '56 in Orrville, O., Remington, Ind., and Estherville, Iowa; also, one new plant for early '56 in Rochester, N. Y.

Fluorine

Pennsylvania Salt Manufacturing Co.

Location: Calvert City, Ky.; due in: late '56.

Fluorinated hydrocarbon refrigerants, tetraethyl lead

Du Pont Co.

Location: Antioch, Calif.; due in: late '56.

Expansion Checklist for '56

Fluorspar (acid grade)

Pennsylvania Salt Manufacturing Co.
Location: Mexico, Ky.; due in: by '56.

Glass

Pittsburgh Plate Glass
Location: Cumberland, Md.; cost: $34 million; due in: Oct. '56.

United States Flat Glass Corp.
Location: northern Virginia; capacity: 70 million sq. ft. sheet glass and 25 million sq. ft. plate glass annually.

Glycerine

Shell Chemical Corp.
Location: Norco, La.; capacity: 30 million lbs./year.

Glycol ethers

Ansul Chemical Co.
Location: Marinette, Wis.; will triple present capacity; cost: $50,000; due in: Jan. '56.

Gypsum products

Kaiser Gypsum Co.
Location: Pittsburg, Calif.; capacity: 274 million sq. ft. gypsum board products, and 20,000 tons of plaster per year.

National Gypsum Co.
Location: Westwego, La.; cost: $6 million.

United States Gypsum Co.
Location: Houston, Tex.; cost: $15-20 million.

Hydrocarbons

Portland Gas & Coke
Location: Portland, Ore.; cost: $16 million.

Hydrochloric acid

Hooker Electrochemical Co.
Location: Montague, Mich.; cost: $2.6 million; due in: July '56.

Hydrogen

Procter & Gamble Co.
Location: Chicago, Ill.; cost: $300,000.

Hydrogen peroxide

Food Machinery & Chemical, Becco Division
Location: Vancouver, Wash.; will increase capacity by 50%; cost: $1 million; due in: early '56.

Columbia-Southern Chemical Corp.
Location: Barberton, O.; due in: Oct. '56.

Shell Chemical Corp.
Location: Norco, La.; due in: late '56.

Inorganic chemicals

Monsanto Chemical Co.
Location: Monsanto, Tenn.; due in: mid-'56.

Insecticides

Stauffer Chemical Co.
Location: Omaha, Neb.; due in: Jan. '56.

Isobutane

Skelly Oil Co.
Location: Eunice, N. M.; cost: $250,000.

Lube additives

Sinclair Refining Co.
Location: Houston, Tex.; due in: Jan. '56; cost: $2.2 million.

Magnesia, zirconia, boron carbide

Norton Co.
Location: Huntsville, Ala.; cost: $1.3 million.

Maleic anhydride

Reichhold Chemicals, Inc.
Location: Elizabeth, N. J.; capacity: 2 million lbs./year; due in: Jan. '56.

Melamine

American Cyanamid Co.
Location: Wallingford, Conn.; capacity: 20 million lbs./year; due in: June '56.
Location: Willow Island, W. Va.; capacity: 10 million lbs./year; due in: Jan. '56.

Mercury

Rare Metals Corp.
Location: Weiser, Ida.; capacity: 170 tons/day.

Methylstyrene

American Cyanamid Co.
Location: Fortier, La.; capacity: 40 million lbs./year; due in: July '56.
Location: Wallington, Conn.; due in: early '56.

Monazite derivatives

Davison Chemical of Baltimore
Location: Curtis Bay, Md.; capacity: 10,000 tons/year; cost: $2 million; due in: July '56.

Monomethylstyrene

American Cyanamid Co.

Location: Avondale, Va.; capacity: 40 million lbs./year of plastic intermediates; cost: $5 million.

Muriatic acid

Columbia-Southern Chemical Corp.

Location: Barberton, O.; due in: June '56.

Niacin

Ansul Chemical Co.

Location: Marinette, Wis.; cost: $200,000; due in: Jan. '56.

Nickel

Freeport Sulphur Co.

Location: New Orleans, La.; capacity: 50 tons/day.

Niobium, tantalum pentoxides

Mallinckrodt Chemical Corp.

Location: St. Louis, Mo.; capacity: 1 million lbs./year.

Nitric acid

Northern Chemical Industries Inc.

Location: Searsport, Maine; capacity: 21,000 tons/year; due in: early '56.

Spencer Chemical Co.

Location: Vicksburg, Miss.; cost: $1.5 million; expanding current nitric acid, ammonium nitrate and ammoniating solutions capacity; due in: spring, '56.

Nitrogen solutions

Ketona Chemical Corp.

Location: Ketona, Ala.; capacity: 40,000 tons/year; due in: March '56.

Northern Chemical Industries Inc.

Location: Searsport, Maine; capacity: 45,000 tons/year; due in: early '56.

Nitroguanidine

American Cyanamid Co.

Location: Pryor, Okla.; due in: late '56; cost: $20 million.

Organic intermediates

Maumee Chemical Co.

Location: Toledo, O.; capacity: 300,000 lbs./year; cost: $50 million; due in: May '56.

Crown Zellerbach Corp.

Location: Camas, Wash.; capacity: 2 million lbs./year; due in: late Jan. '56.

Organic-tin compounds

Metal & Thermit Corp.

Location: Rahway, N. J.; cost: $100,000; due in: May '56.

Paints, enamels, thinners

Du Pont Co.

Location: Tucker, Ga.; due in: summer '56.

Paper

Great Lakes Paper Co.

Cost: $20 million; capacity: 260,000 tons/year.

Hudson Pulp & Paper Corp.

Location: Palatka, Fla.; capacity: 100,000 tons/year; cost: $25 million.

International Paper Co.

Location: Mobile, Ala.; capacity: 100,000 tons/year; cost: $20 million; due in: late '56.

National Gypsum Co.

Location: Anniston, Ala.; capacity: 200 tons/day.

Southland Paper Mill, Inc.

Location: Lufkin, Tex.; will add a third unit; cost: $15 million; due in: July '56.

Para-cresol

Hercules Powder Co.

Location: Gibbstown, N. J.; capacity: 3 million lbs/year; due in: Oct. '56.

Sherwin-Williams Co.

Location: Chicago, Ill.; cost: $1.1 million; due in: June '56; will double capacity to over 4 million lbs./year.

Paracril

Naugatuck Chemical Division, U.S. Rubber Co.

Location: Baton Rouge, La.; a 50% increase in current capacity; due in: July '56.

Pentaerythritol

Hercules Powder Co.

Location: Louisiana, Mo.; capacity: 25 million lbs./year; cost: $6 million; due in: late '56.

Perchlorethylene

Columbia-Southern Chemical Corp.

Location: Barberton, O.; due in: June '56.

Expansion Checklist for '56

Pharmaceuticals

Abbott Laboratories

Location; North Chicago, Ill.; a 10% increase in current capacity; due in: Jan. '56.

Phenolic and Epoxy Resins

Marblette Corp.

Location: Long Island City, N. Y.; capacity: 1 million lbs./year; cost: $1.2 million due in: Jan. '56.

Phosphorus

Central Farmers Fertilizer

Location: Georgetown Canyon, Ida.; capacity: 100,000 tons/year of calcium metaphosphate; cost: $10 million.

Shea Chemical Corp.

Location: Columbia, Tenn.; capacity, 40,000 tons/year; cost: $2.25 million; due in: June '56.

Phosphoric acid, dicalcium phosphate

Shea Chemical Corp.

Location: Adams, Mass.

Western Phosphates, Inc.

Location: Garfield, Utah; will triple current capacity of superphosphate and ammonium phosphate by fall of '56; cost: $2.25 million.

Phthalic anhydride

Pittsburgh Coke & Chemical Co.

Location: Neville Island, Pa.; will double present capacity; cost: $3 million; due in: fall '56.

Reichhold Chemicals, Inc.

Location: Detroit, Mich.; capacity: 8 million lbs./year; due in: April '56.
Location: Azusa, Calif.; capacity: 10 million lbs./year; due in: July '56.

Phthalocyanine pigments

Sherwin-Williams Co.

Location: Chicago, Ill.; cost: $1 million.

Plasticizers, tricresyl phosphate

Celanese Corp. of America

Location: Gallipolis Ferry, W. Va.; cost: $4 million; due in: April '56.

Plastics

Shawinigan Resins Corp. and Monsanto Chemical Co.

Location: Trenton, N. J.; due in: late '56.

Polyethylene

Du Pont Co.

Location: Beaumont, Tex.; due in: Dec. '56.

Hercules Powder Co.

Location: Parlin, N. J.; capacity: 30 million lbs./year; cost: $10 million; due in Dec. '56.

Phillips Chemical Co.

Location: Adams Terminal, Tex.; capacity: 301,000 lbs./day.

Polystyrene, foamed

Dow Chemical Co.

Location: Ironton, O.; due in: fall '56.
Location: Riverside, Mo.; due in: fall '56.

Polyvinyl chloride

Eleanora Chemical Corp.

Location: Passaic, N. J.; due in: late '56.

Insular Chemical Co.

Location: Long Island; due in: spring '56.

Shawinigan Resins Corp.

Location: Springfield, Mass.; capacity: over 1 million lbs./year; cost: $1 million.

Potash

Farmers Chemical Resources Development Co.

Location: Carlsbad, N. M.; cost: $13 million.

National Potash Co.

Location: Carlsbad, N. M.; capacity: 250,000 tons/year; cost: $19 million; due in: late '56.

Potassium hydroxide

Pennsylvania Salt Manufacturing Co.

Location: Calvert City, Ky.; due in: early '56.

Potassium sulfate

International Minerals & Chemical Corp.

Will increase capacity 40,000 tons/year.

Printing Inks

Interchemical Corp.

Location: Cincinnati, O.; cost: $2 million; due in: Nov. '56.

Pulp

Gulf States Paper Co.

Location: Demopolis, Ala.; capacity: 300 tons/day; due in: summer '56.

Rayon staple

American Enka Corp.

Location: Lowland, Tenn.; capacity: 50 million lbs./year; cost: $21.0 million; due in: late '56.

American Viscose Corp.

Location: Front Royal, Va., and Parkersburg, W. Va.; capacity: increased 20%; due in mid '56.

Courtaulds Ltd.

Location: Alabama; capacity: 150 million lbs./year.

Resorcinol

Koppers Co., Inc.

Location: Petrolia, Pa.; will increase current capacity by 40%; due in: mid-'56.

Resins

Reichhold Chemicals, Inc.

Will expand resin facilities at Ballardsville, Mass., Detroit, Mich., and San Francisco, Calif.; cost: $10 million.

Rubber

B. F. Goodrich Chemical Co.

Location: Louisville, Ky.; cost: $2.8 million; due in: first quarter '56.

Du Pont Co.

Location: Montague, Mich.; due in: late '56; cost: $15 million.

General Tire & Rubber Co. and El Paso Natural Gas Co.

Location: Odessa, Tex.; capacity: 40,000 lt./year.

Goodrich-Gulf Chemicals, Inc.

Location: northern Ohio; capacity: 12 tons/day; cost: $0.75 million.
Location: Port Neches, Tex.; capacity: 18,000 ton/year.

Firestone Tire & Rubber Co.

Locations: Lake Charles, La., or Orange, Tex.; cost: $30 million.

Petroleum Chemicals, Inc.

Location: Lake Charles, La.; cost: $4 million.

Phillips Chemical Co.

Location: Borger, Tex.; expansion of 37%; due in: '56.

Texas-U. S. Chemicals, Inc.

Location: Port Neches, Tex.; a 35% increase in current capacity.

Rubber latex

Shell Chemical Corp.

Location: Torrance, Calif.; due in: May '56.

Soda ash

Westvaco Chlor-Alkali Division, Food Machinery & Chemical Corp.

Location: Green River, Wyo.; capacity: 300,000-350,000 tons/year; due in: Jan. '56.

Sodium bisulfate

Ansul Chemical Co.

Location: Marinette, Wis.; cost: $200,000; due in: Jan. '56.

Sodium chlorate

Oldbury Electro-Chemical Co.

Location: Columbus, Miss.; capacity: 3,000 tons/year; due in: April '56.

Sodium phosphates

Shea Chemical Corp.

Location: Dallas, Tex.: capacity: 60,000 tons/year; due in: Oct. '56.

Specialty products

Procter & Gamble Co.

Location: Iowa City, Iowa; due in: fall '56.

Styrene

Bakelite Co. Division, Union Carbide and Carbon Corp.

Location: Marietta, O.; cost: $2.7 million; due in: Jan. '56.

Foster-Grant Co.

Location: Baton Rouge, La.; capacity: 50 million lbs./year.

U.S. Rubber Co.

Location: Baton Rouge, La.; cost: $1.4 million.

Styrene-butadiene copolymers

Dewey and Almy Chemical Co. Division, W. R. Grace & Co.

Location: Acton, Mass.; capacity: 4 million lbs./year; cost: $150,000; due in: April '56.

Styrene resins

Marbon Chemical Division, Borg Warner Corp.

Location: Washington, W. Va.

Sulfonated alkylated aromatics

Stepan Chemical

Location: Joliet, Ill.; cost $150,000; capacity: 2-3 million lbs./year.

Sulfur

Canadian Gulf Oil Co.

Location: Pincher Creek, Alberta; capacity: 225 tons/day.

Sinclair Refining Co.

Location: Marcus Hook, Pa.; capacity: 35 tons/day: due in: Jan. '56.

Tide Water Associated Oil Co.

Location: Delaware City, Del.

Sulfuric acid

Allied Chemical & Dye Corp., General Chemical Division

Location: East St. Louis, Ill.; due in: April '56.

American Cyanamid Co.

Location: Joliet, Ill.; capacity: 150 tons/day; due in: Jan. '56.

Consolidated Chemical Industries

Location: Le Moyne, Ala.; capacity: 500 tons/day; due in: late '56.

Du Pont Co.

Location: Ohio.

National Farmers Union Resources Corp.

Location: Rich County, Utah; cost: $5 million.

Northern Chemical Industries Inc.

Location: Searsport, Maine; capacity: 45,000 tons/year; cost: $600,000.

Reichhold Chemicals, Inc.

Location: Tuscaloosa, Ala.; capacity: 100 tons/day; due in: Feb. '56.

U.S. Industrial Chemicals Co. division, National Distillers Products Corp.

Location: Tuscola, Ill.; capacity: 140,000 tons/year; cost: $2 million.

Tall oil

Hercules Powder Co.

Location: Savannah, Ga.; due in: late '56.

Location: Franklin Va.; capacity: 35,000 tons/year; due in: Feb. '56.

Union Bag & Paper Corp.

Location: Savannah, Ga.; capacity: 15,000 tons/year.

Tin Oxide

Metal & Thermit Corp.

Location: Carteret, N. J.; cost: $50,000; due in: Jan. '56.

Titanium

Columbia-Southern Chemical Corp. and Columbia Titanium Co.

Location: Natrium, W. Va.; due in: April '56; cost: $10 million; capacity: 5,000 tons/year.

Cramet, Inc.

Location: Chattanooga, Tenn.; capacity: 6,000 tons/year; cost: $25 million; due in: early '56.

Dow Chemical Co.

Location: Midland, Mich.; capacity: 5 tons/day; due in: mid-'56.

Du Pont Co.

Location: Johnsonville, Tenn.; capacity: 7,500 tons/year; cost: $40 million.

Harvey Machine Co.

Capacity: 6,000 tons/year.

Titanium Metals, Inc.

Location: Henderson, Nev.; capacity: 5,400 tons/year.

Union Carbide and Carbon Corp.

Location: Ashtabula, O.; capacity: 7,500 tons/year; cost: $31.5 million; due in: mid-'56.

Titanium dioxide

Du Pont Co.

Location: Edge Moor, Del.

Glidden Co.

Location: Sparrows Point, Md.; capacity: 12,000 tons/year; first of three units due in: May '56.

Titanium Pigments, Inc.

Location: St. Louis, Mo.; capacity: 36,000 tons/year.

Urea

Shell Chemical Corp.

Location: Ventura, Calif.; capacity: over 100 tons/day; due in: Sept. '56.

Standard Oil Co.

Location: Lima, O.; capacity: 43,200 tons/year; due in: Jan. '56.

Vinyl acetate monomer

Air Reduction Co., Inc.

Location: Calvert City, Ky.; capacity: 30 million lbs./year; cost: $3 million; due in: first quarter '56.

Vinyl chloride

Allied Chemical & Dye Corp., Solvay Process Division

Location: Moundsville, W. Va.; due in: March '56.

Simpson Coal & Chemical

Location: Natchez, Miss.; cost: $20 million; due in: second quarter '56.

Vinyl stabilizers, stearates and specialty products

Synthetic Products Corp.

Location: Cleveland, O.; expanding current capacity.

'56 Forecast for BUSINESS & INDUSTRY

YOU can't heap enough superlatives on the business outlook for chemical and allied process companies in 1956. The year ahead, according to all economic indicators, should be characterized by continued boom conditions in sales, earnings and expansion.

The next 12 months should be a period in which the great majority of firms register a 15% gain in sales, a 15-20% increase in profits after taxes, and raise capital expenditures close to all-time record levels.

Only in the race to get new production capacity into operation should there be cause for wrinkled brows and furrowed foreheads. U.S. economy for the next several years will be paced by raw material shortages—more than by any other factor—and the shortages will be both a blessing and a burden to chemical management.

Other business highlights to be expected in 1956: chemical cash dividends should exceed those of 1955 (*see Charting Business, Dec. 24, p. 17*), stock dividends are indicated in some cases, and a number of cash extras and several stock splits are likely.

Overcapacity could be a problem in certain sectors of the industry (*see Market Forecast, p. 43*) but the impact on the chemical industry as a whole should not be great. Reason: although the chemical industry is currently growing at a faster rate than U.S. economy as a whole, its outlets are broadening, will soon begin to absorb a far greater output.

EARNINGS

With chemical sales estimated (for 1955) at a new peak of $23.5 billion, further gains (in 1956) would seem to be just so much more frosting on the cake.

Prospects for the 12 months ahead are impressive—due partly to the rash of new plants coming onstream (*see Expansion survey, p. 30*) and predicted price increases.

Also, many chemical firms in '56 will find wider foreign markets for their products, will have somewhat lower depreciation costs and lighter overhead expenses (e.g., in 1954, a number of chemical companies that scored top earnings took decreased profits because of heavy expansion expenditures).

Since the end of World War II (according to estimates compiled by the Manufacturing Chemists' Assn.), the chemical industry has spent over $10 billion for new plants and equipment. Of this, a sizable amount has been invested since the outbreak of the Korean War, in large part to meet the expansion goals of the National Production Authority, thus qualifying for rapid tax amortization.

As a consequence, earnings have been penalized by sharply higher depreciation and amortization charges.

In 1956, however, the outlook is for a gradually lessened drain on earnings, which should be reflected in higher net profits after taxes.

TAXES

The possibility of a lower corporate tax rate in 1956 is remote.

Most Washington observers now agree that Congress will extend the 52% rate on corporations soon after it reconvenes on Jan. 3; only a severe downturn in general business conditions would prompt any drive for a decrease—and then the decrease would probably go no lower than 50%.

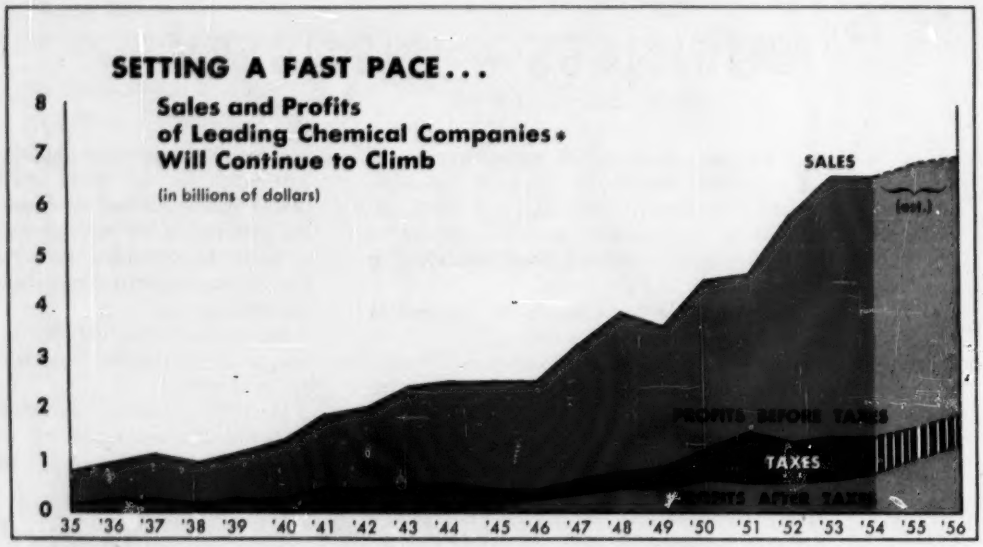
Regulations could get even more rigid if a technical tax bill—or one involving tax-exempt organizations—gets enough Democratic support. Congressional tax experts have been openly alarmed in recent months over the broadness of the tax exemption given to organizations that conduct "testing for public safety." They fear that the Internal Revenue Service's regulations cannot limit the provision with any degree of precision, maintain that there is a big loophole in the law "for those unscrupulous companies that seek to find it."

Too, there's an almost certain tightening ahead in Internal Revenue's tax treatment of nonprofit research organizations that do a significant amount of commercial-type testing.

But for executives, there may be some personal tax relief.

Top Democrats are now talking about a tax reduction bill that would throw back some income to individuals and heap a proportionally greater burden on business. For instance, the Democrats would repeal the dividend credit provision of the 1954 tax law, would tighten up on faster depreciation credit, etc.

Such proposals are still only in the talking stage, however, could bog down before they really get serious consideration.



TARIFFS AND TRADE

Decisions on major trade and tariff policies—such as a switch toward increasing use of import quotas and a strengthening or weakening of the reciprocal trade program—might be in the offing for 1956; but the general level of U.S. tariffs and other foreign trade obstacles will remain about where it is now. Though there'll be upward and downward shifts on specific duty rates, no major tariff changes on important chemical products seem to be in the cards.

U.S. tariffs will probably be cut on a wide range of products—possibly some chemicals—during the GATT* negotiations next month at Geneva. Negotiators for the U.S. will offer concessions on nearly 1,000 import items; but the new tariff-cutting authority (15% over three years) granted to the President in the trade agreements law is so limited that the net effect on intensity of foreign competition in the U.S. market will be small.

A number of industries are currently seeking increased protection against foreign competition on grounds that they're essential to defense—per the as-yet-untried defense clause of the Trade Agreements Act. Potentially, this could be important to those sections of the chemical industry that are vital to national defense; but so far, the only chemical products for which relief is being requested are fluorspar and—perhaps—digitoxin.

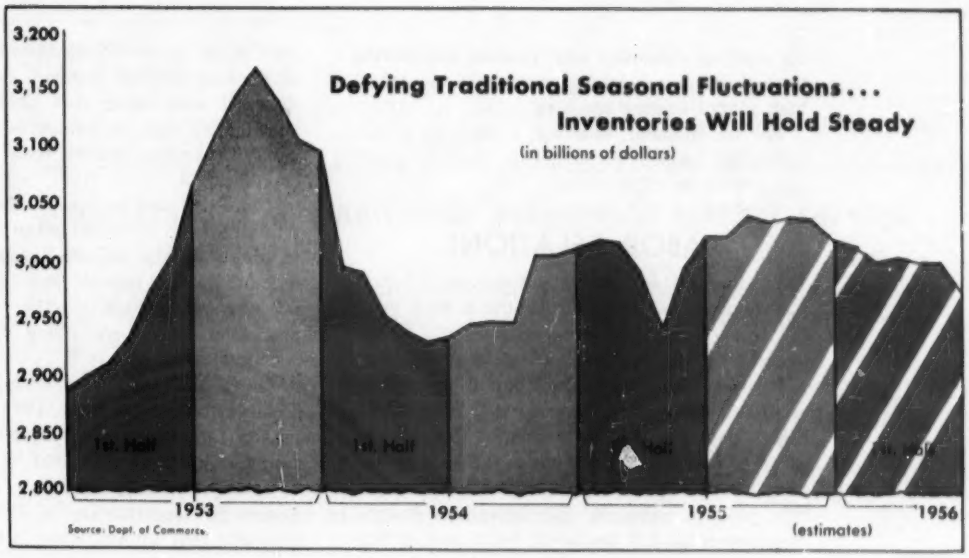
Waging a determined drive to narrow coverage of the antidumping act of 1923 will be the recently formed National Antidumping Committee, which speaks primarily for importing groups. Parts of the chemical industry will undoubtedly get into this fight on the opposing side, because many chemical firms traditionally regard the antidumping law as a major safeguard against unfair foreign competition.

Most important trade policy battle in the upcoming session of Congress will be over proposed imposition of quotas on cotton textile imports. This could mean much to the chemical industry in the future, since setting of quotas by Congress on one line of products would set precedent for similar action on chemicals and other lines. The vigorously protectionist Nation-wide Committee of Industry, Agriculture & Labor on Export-Import Policy is now fighting for quotas on all items.

Whatever Congress does vis-à-vis the proposed Organization for Trade Cooperation (OTC)—which is designed to police GATT pacts—will have a big effect on future foreign commercial policy. Approval of OTC would confirm and strengthen the reciprocal trade program; rejection of OTC could pave the way for a gradual unraveling of the complex fabric of tariff concessions woven over the past 20 years. Outlook now: that OTC will be shelved for another year, leaving things about where they are now.

*General Agreement on Tariffs and Trade.

* Included in tabulation: Abbott Labs., Air Reduction, Allied Chemical & Dye, American Potash, Atlas Powder, Commercial Solvents, Consolidated Chemical Industries, Diamond Alkali, Dow, Du Pont, Eastman Kodak, Freeport Sulphur, Heyden, Liquid Carbonic, Merck, Monsanto, Pennsalt, Chas. Pfizer, Pittsburgh Coke & Chem., Sun Chemical, Texas Gulf Sulphur, Union Carbide, and Victor.



ANTITRUST

There'll be a serious drive on the part of Democrats in Congress to put some new antimerger laws on the books. Two bills on this topic will get minute attention:

- To require corporations above a certain size to get advance approval from the government before they merge.
- To give the Federal Trade Commission the same kind of authority now held by the Dept. of Justice to go into court to block a merger before it takes place.

Two other antitrust bills are advocated by the Eisenhower Administration, but probably won't get much backing from the Democrats in control of Congress. One would leave it up to the judge whether to assess the triple damages now required in private antitrust cases.

The other Adminstration-favored bill—perhaps the most important antitrust proposal now in sight—is aimed at reinforcing the Justice Dept.'s investigative powers. This bill would create a "civil investigative demand"—a kind of subpoena—that would enable the Attorney General to look at corporation documents and question company officials in order to get information for use in preparing a civil antitrust suit. This bill is likely to die because of congressmen's fear that such powers might be abused.

The new year also may produce major rulings on antitrust issues, with at least four antimerger suits pending in the courts and with six such cases being argued before the FTC.

MANPOWER

Of all the potential shortages that could mean trouble to chemical management in 1956, the dearth of scientific manpower could be the most nettlesome.

Companies in some sections of the country—particularly the South and Midwest—are complaining that new facilities expected onstream in the early months of 1956 will be forced to "go" with staffs culled from other company installations.

And the graduating crop of chemists and chemical engineers next June won't go far to ease the pinch. Current rate of graduation of chemists with a B.S. degree is 3,000-3,500/year; with an M.S., 1,000/year; with a Ph.D., 1,000/year.

The shortage isn't limited to lower personnel echelons, either.

Top management continues to be in tight supply in most sectors of the nation; the trend should continue in ever-increasing force in 1956.

What the chemical and allied process industries decide to do about the situation now could affect them many years hence.

Most companies are reviewing their manpower rosters with an eye to reorganizing current available personnel, turning over nontechnical duties to nongraduate workers.

Others—realizing that the scientific-manpower situation can only get worse if something is not done to cure the cause at the source—are making an attempt to lure more youngsters into

the study of chemistry and chemical engineering through films, scholarship programs, and aid to high school science teachers.

For the moment, however, a shortage of scientifically trained personnel is sure to pinch many firms in 1956.

LABOR RELATIONS

Big changes are on the horizon for labor in the chemical industries during the coming year; but few—if any—of those changes will be induced by new labor laws out of Washington.

It appears that very few labor dishes will be on the Congressional menu for the session that begins next Tuesday, with neither the Administration nor organized labor planning any all-out drive for specific legislation. The principal bills now in prospect: extending the federal minimum-wage law to cover retail and service employees, and setting up federal regulations for union welfare funds.

Anticipated 1956 developments that will make a difference in this industry:

- Stepped up organizing of chemical workers, with subsidies from the AFL-CIO treasury to help the two chemical unions in this work.
- Increasing use by those two chemical unions of company-wide and sub-industry-wide councils to coordinate bargaining tactics.
- Increasing cooperation between those two chemical unions, with a formal merger likely in 1957—perhaps even before the end of '56.
- Adherence to policies that will mean fewer strikes than in 1955—partly because both these unions want to break away from their "red ink" budgets of the past year.

There's likely to be more friction with the independent unions, with one feud still smoldering and others sure to break out because of the AFL-CIO's aggressive organizing plans.

Both the Eisenhower Administration and the AFL-CIO will suggest changes in Taft-Hartley, but neither side wants an election year fight on this issue.

Meanwhile, the AFL-CIO's political activity is rising. Moderate Republicans are trying to keep labor uncommitted, but AFL-CIO endorsement of the Democratic slate is almost certain.

FINANCING

A change, equally important but less spectacular, will be noted in chemical financing circles in 1956. Leading firms, with large expansion plans on tap and scheduling increased capital outlays for next year, are taking a fresh look at the possibility of financing at least some of the cost through common stock issues. Most financial men agree that in the months just ahead there may be definite advantages in such equity financing—rather than increasing debt capitalization.

There will also be (as was the case this year) a trend toward increased use of retained earnings to supply needed capital. Reason for the ability of most firms to provide such funds: accelerated tax write-offs, which, together with normal depreciation, have been piling up funds in this account.

As an example: Dow Chemical Co. for its fiscal year ending May 31, 1955, reported $73.5 million for depreciation, depletion, and amortization—should up that total by 7% this year.

Union Carbide, similarly, deducted $93.7 million for depreciation in 1954, should have increased that amount some 20% by 1956.

For smaller firms, there may be some tightening of expansion capital noticeable in the early months of 1956. But a good deal of the pressure should ease by late spring. Chief reason: by then the business picture should be so bright that even normally reluctant money lenders will feel pressed to put idle capital to work.

LONG-TERM POTENTIAL

Long-term potential for the chemical and allied process industries, in the light of such conditions, is, to say the least, extraordinary.

There are bound to be some temporary conditions that offer annoyance to a minority group of firms (e.g., the chemical industry is bound to be "invaded" in the years ahead by companies from a number of different fields, and increasing competition).

Pollution is bound to be a problem for many years to come—until state and local governments come together with industry in a joint effort for fair and uniform enforcement. One main approach during 1956: orders emanating from state regulatory agencies. For example, both New York and Tennessee are issuing specific directives to individual plants to curb stream pollution or face court action.

And the omnipresent threat of foreign competition will cause executives to scratch hard to keep up in the marketing race.

But the over-all growth prospects for chemical firms cannot be denied.

Now the fourth largest industry in the U.S., and branching out into all phases of the economy, chemicals' prospects are so promising that 1956 cannot fail to be a banner year.

'56 Forecast for MARKETS

Summary of CW's new-year nationwide market survey:

- **SUPPLY.**
  A few items (selenium, silicofluoride, nickel and copper derivatives) will continue "tight", but most will rate "amply available."
- **DEMAND.**
  Chemical consumption curve will rise as output of consuming industries—construction, textiles, automobiles, etc.—remains high.
- **PRICES.**
  Many are going up in the first quarter, and you can look for additional advances at the three-quarter mark.

IT DOESN'T take a crystal ball to foresee that the upcoming 12 months could be aptly tabbed the Year of Chemical Plenty.

Country-wide consensus among consumers—as well as producers—sums up the over-all 1956 supply/demand situation this way:

- Few chemical users expect any difficulty in obtaining all they need all the time.
- Most producers anticipate a tougher, albeit more profitable, selling year.

It's generally conceded, too, that prices—despite the more lively competition for markets—will continue to trend upward. First-quarter schedules (higher in many instances) are being posted this week; the next likely pivot point is Oct. 1. But don't be surprised if some items—pharmaceuticals, for example—inch up sooner than that.

Broadly speaking, it would appear that 1956 will check out at a fairly happy level—sales anywhere from 5% to 25% better than in '55, depending on locality, at no sacrifice of price or profit.

Rundown by Region: Although sectional boundaries continue to have less and less real influence on market prognostications, *CW*'s new-year survey turns up some interesting area-by-area variations—but with the same optimistic theme. Here's the West to East tally:

"In terms of chemical consumption, 1956 should be a good deal better than '55—and '55 is one of the best we've had." Thus does one West Coast marketer envision the future in his section.

All basic commodities, now in fairly well-balanced supply in the West, should remain so right down the line during the new year. With steel, plywood, construction, and other industries booming right along, items such as paints, resins and plastics will have high consumer demand.

Inventories are low, and this, too, will bulge the business curve upward.

More specifically, there should be no shortage worries about the important heavy acids (sulfuric, nitric, hydrochloric), chlorine, caustic, glycols, alcohols, pesticides or ag chemicals.

Spot shots of tightness may pop up in phenol, phthalic anhydride and methyl ethyl ketone—but these won't be for lack of producing capacity.

Selenium and nickel derivatives will probably continue in true short supply.

Prices in the West, by and large, should be more stable, though some (e.g., fine chemicals) are expected to move up slightly. Such increases will be laid to higher labor and raw material costs. That's a plaint that will be heard more frequently here, as well as in most other areas.

Don't look for many significant price reductions in the chemically wide-open Southwest, either. Consensus on prices: if there are revisions, they'll be upward. Reason: sales will be good enough to squelch any general cutting.

A few commodities, though, may slip: muriatic, ammonia, glycols, polyethylene, acetone. These and a few others will be in easy supply.

On the other hand, the list of chemicals slated to be tight—at least during some part of '56—include methanol, formaldehyde, toluol, xylol,

sulfur and—surprisingly—chlorine in a few sections.

Sum-up for the Southwest: 1956 will be highly competitive, but a good year for hustlers.

Midwest Markets: Reports from the wide mid-U.S. area read like carbon copies of comments heard elsewhere: "Most key chemicals are either in good balance or slightly on the long side." "Prices, edging up now, may hop again in mid-year as they did in '55." Reasons, again: labor and raw material costs.

In addition to the basic chemical hikes expected, some observers tab pharmaceuticals for a price rise. Says one: "Historically, the pharmaceutical industry has been slow to raise prices, but we expect it to happen in '56."

Here, as in other parts of the country, nickel-bearing and selenium chemicals will be hard to get. And these can be added to the short supply list: titanium, copper chemicals, sodium silicofluoride, phenolic resins.

On the other end of the scale, ammonia is probably closest to becoming a glut on the market. Phosphates, the acids, caustic, insecticides and most fertilizers will be more than amply available.

"On par with demand" is the supply outlook for '56's soda ash, chlorine, glycerine, benzol and perchlorethylene, among several other items.

Few in the Midwest expect 1956 to be a sky-high sales year; most envisage a comfortable increase of 5% over '55—a rate that could easily climb to 10% "if everything goes along normally."

Farther east and south, the predictions are slightly rosier. One producer, for instance, anticipates a 25% better year compared with '55.

But here, too, the over-all supply/demand situation appears to be one of few shortages, some overages, the majority of chemicals in happy balance.

Silico fluoride and borax are snug, though not likely to be too worrisome. Sulfuric could be, but only in some localized areas where production of steel, rayon, synthetic detergents, for example, gives little sign of tapering off.

Fact is, high-stepping production of chemical-consuming plants throughout the more industrial Eastern and Atlantic Coast sections should forestall market-flooding of just about all products.

Probable clash over guaranteed annual wages, however, could tie up steel, bring with it disruption in both consuming and producing markets. Possible effect of coke-oven shutdowns: a pinch in benzol, toluol, xylol, naphthalene, other coal-tar products.

If the worst happens, look for a backup in such vital steelmaking chemicals as fluorspar, zinc chloride, sulfuric, nitric, muriatic.

Chlorine and caustic, as well as nitrogen, will become more plentiful in Southern areas because of large installations coming onstream. (Savannah, Ga., for example, will have a $14-million, 250-ton/day ammonia plant in operation late in '56—the first synthetic nitrogen plant in the South Atlantic states.)

Prices? Generally speaking they're going up, opine market observers, and the greatest change will probably come in the third and fourth quarters.

Price-cutting to garner outlets will be less in evidence during the upcoming 12-month period, though premium prices will be a factor in hard-to-get materials. In the Northeast, these will continue to be a feature in nickel salts and nickel anodes, for example.

But virtually no other heavy chemical is expected to be in short supply in this area. And, in contrast with reports from other sections, sulfuric production may actually slacken to adjust the supply/demand relationship.

To make it unanimous, marketers here look for some price advances, with anticipated higher wage agreements in new labor contracts taking the blame.

Outlook Sum-up: Perhaps the one word most nearly describing the state of the nation's markets during the new year is "healthy." Prices on the whole will go up some, but chemical consumers aren't likely to raise too much fuss. Most are certain that in the continuing high general economy they can pass along such increases.

The few commodities likely to be tight during '56 will seem even rarer, compared with the many expected to be plentiful. Gluts? A few here and there (probably ammonia, acetone, pesticides in off-seasons, polyethylene), but on the average, brisk demand will preclude market saturation.

Exports will continue to fall off, however, as foreign plants come in to take care of local needs. This will add to U. S. supply, but in the aggregate, the percentage increase will be insignificant—not enough to worry sellers.

Since producers aren't worried about sales, and consumers aren't likely to be concerned with shortage problems, 1956 may well turn out to be a year of plenty—and prosperity—for both.

'56 Forecast for RESEARCH

THE diversified nature of the chemical industries' research hardly lends itself to easy generalities on the future. But it can be said with assurance that the impact of radioactivity will be felt more strongly, and more widely, in 1956 than in 1955.

Not that other developments (e.g., mental drugs, synthetic "natural" rubber, etc.) on the research scene are not important. They are—to their own well-defined areas of activity, whereas radioactivity, in one guise or another, will be important to all:

Petroleum companies will intensify their attempts to use gamma rays in hydrocarbon cracking. (*CW, Dec. 10, p. 84*).

Plastics manufacturers will be stepping up their polymer irradiation studies (*CW, Jan. 29, p. 48*).

Rubber researchers will be plumbing the potential of radiation-vulcanization (*CW, Oct. 15, p. 78*).

Drug producers will be trying to widen the scope of radiation sterilization (*CW, Aug. 6, p. 68*).

Heavy-chemicals makers will be following up pioneering experiments on the use of radiation to make hydrogen peroxide, benzene hexachloride, other commodities (*CW Technology Newsletter, Oct. 8*).

And so it goes: all will be trying to utilize radioactivity to produce new materials, improve the properties of existing products, boost yields and lower energy requirements of processes.

In addition, metals and inorganics producers will be increasingly involved in developing processes and supplying materials (zirconium*, nitrogen-15†, etc.) for military atomic needs and the growing civilian nuclear power program.

And a number of firms will be investigating potential applications of reactor heat in chemical processes (*CW Technology Newsletter, Oct. 1*).

But, above all, it's hard to see how the chemical industry can avoid one of the biggest problems facing nuclear power developers: reprocessing of used reactor fuel elements.

Since the greater part of their original fissionable charge remains unspent, used fuel elements have much valuable cargo. Yet, chemical companies—almost without exception—have been loath to get into recovery work. And the time when private power reactors will need this service is rapidly approaching.

More of Everything: To develop the potential of nuclear energy within the scope of their operations, chemical firms will demand (or demand access to) more "hot" labs and "hot" lab apparatus, more radiation sources (radioactive cobalt pipes, particle accelerators, nuclear reactors, etc.), more qualified consultants, more trained researchers, and more of any number of goods and services.*

In response to the mounting need:

- A host of new "hot" research facilities will be under construction or completed. How many is not known, but such facilities bulk large in a Manufacturing Chemists' Assn. survey, now under way, of new and planned laboratories.†
- Nuclear research reactors available to companies on a leased-time basis (or some other contractual arrangement) will be completed or approaching completion at Armour Research Foundation, Battelle Memorial Institute, Massachusetts Institute of Technology, Universities of Michigan, Washington, Buffalo and Florida. Already operating: reactors at Pennsylvania State University and North Carolina State College.
- The research reactor being built in northern New Jersey by AMF Atomics (*CW, Aug. 27, p. 44*) for itself and nine others (including Atlas Powder, Corning Glass, International Nickel, Chas. Pfizer, Socony Mobil Oil and U.S. Rubber) will be ready for service.
- One chemical company (Dow) has revealed that it plans to build a research reactor for its own use, and at least one other firm will make a similar disclosure next year.
- Isotope consumption will continue to rise.

Big Question: Of top importance in nuclear research year 1956 will be the problem of securing the battalions of researchers needed to implement industry's dynamic plans. Other problems will arise, too. But what bodes well for the year ahead is a clear indication that there's no shortage of the will to attack them.

*AEC is said to be planning to ask industry for proposals on delivery of 2 million lbs. of high-purity zirconium over five years. Any process will be considered, says AEC.

†*CW, Nov. 5, p. 40.*

*The coming year should see the expenditure of a substantial part of the $300 million that it is estimated will be spent for private nuclear research and development during 1955-59.

†At the close of 1954, according to the previous MCA survey, $16.1 million worth of chemical industry labs were in the planning stage.

'56 Forecast for PRODUCTION

WITH the shortages of raw materials and equipment over, with the pressure for more production to meet changing delivery schedules largely a thing of the past, the men who man the chemical plants in '56 are going to have more time to spend on the niceties of plant operations.

They'll be concentrating more on quality control, production improvement methods—materials handling in particular—and process changes to make production more efficient. There'll be more emphasis on yields and quality than there ever was before. And there'll be a step-up in tempo of programs aimed at paring costs and bettering safety records.

But they don't expect life to become leisurely overnight. In exchange for the short-range problems that need the immediate solution, chemical plant management will find itself up against the long-range, gnawing, worrisome kind.

Good Man Hard to Find: Look, for instance, at the manpower shortage. Take whatever figures you like and juggle them however you want. You can't get away from this conclusion: The chemical industry is facing a long-drawn-out shortage of skilled operating talent at all levels—from management engineers down to skilled craftsmen.

What's the solution? There's no single answer but, as usual, the problem will be solved by a combination of approaches. Mostly, industry will just have to search harder and longer in more places. Foreign colleges may prove a fertile spawning ground for bright young engineers. And more and more, chemical management will have to come around to the "do-it-yourself" idea to get polished chemical engineers. They'll have to take the college graduate as raw material and process him into the finished product. And they'll have to do it with company money on company time—in plant class rooms.

Pollution a Top Worry: Watch for more headaches concerning pollution. Here's why: Business is good, getting better. People will have more money and more time for spending it. And it's during leisure time—in the back yard, on the fishing stream, etc.—that pollution really grates. To keep in step and out of trouble, chemical production people will have to put more muscles into their antipollution campaigns. And just as important, they'll have to let the rest of the population in on what they're doing.

Room for Control: Completely automatic production is a long way off for most chemical process plants. But 1956 should see some big strides toward the goal of "closing the loop." Better plant stream analyzers are coming out all the time, automatic data loggers are attracting lots of attention. And computers are steadily being improved.

Right now, of course, chemical plants are so highly instrumented that it's getting increasingly difficult to justify heavier investments in instruments simply to save on manpower. But there's still much to be done in the way of automatic quality control.

Progress in Process: Technologically, of course, it should be a big year for new chemical processes. Carbide will probably not reveal any plans for a commercial coal hydrogenation plant for another year at least. But gradually, the mechanical difficulties are being ironed out. Chemical Construction's acid leach for metals extraction may finally be out of the woods in view of '55's creditable showing at the Howe Sound cobalt refinery.

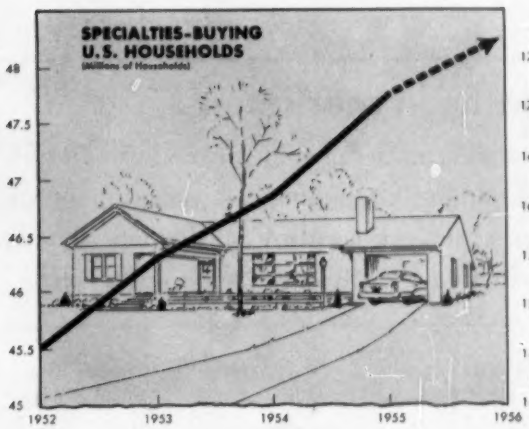
Nonelectrolytic processes to make hydrogen peroxide kicked up a storm in 1955 and they will do the same through '56. Shell's new process to make it from isopropanol, in particular, should nail down a lot of attention (although the plant is not due to start up until early '57.

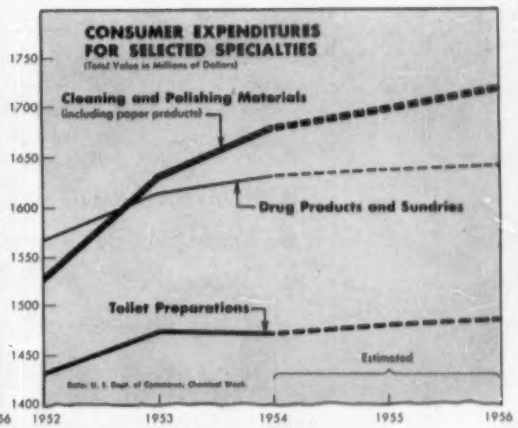
Titanium will continue to corner a large portion of process developers' time.

Other big developments to watch are General Aniline & Film's high-pressure acetylene plant and Standard of Indiana's efforts to revitalize the Fischer-Tropsch venture in Brownsville. During 1955, a large portion of the significant chemical news dealt with plans to license low-pressure polyethylene processes from Phillips or from Ziegler. The new year should tell whether the faith in these two processes was well placed.

By and large, these trends have been shaping up for years. There will be no sharp, abrupt changes in the year ahead. Life for the plant man is pretty much dictated by the economic tenor. If you designate 1955 as P-(for Prosperity-) year, then just put down 1956 as P-year plus one.

'56 Forecast for SPECIALTIES





THEY'RE not sentimental about it, but few segments of industry are more interested in the U.S. home than chemical specialties makers. They might well be. Name any of the symbols for the home—the fireside, the kitchen, Mother—and you tag a specialties market. Indications are that these markets are all growing.

Demographers are not the only ones interested, for example, in the growing number of U.S. households. The Census Bureau estimates that there are some 47,788,000 households in the U.S., and there is little to suggest that the number will stop increasing. Also, 1955 showed an increasing number of married couples—and a greater percentage of these, compared with past years, maintain their own household rather than share or "double up."

Spending for some specialties products has gone up somewhat, too—increasing at roughly the rate of increasing households. Actually, the amount spent per household has gone up slightly; perhaps more important is the fact that it hasn't slumped in the last few years. According to a recent survey of consumer spending attitudes (made by the University of Michigan; published in *Business Week*), most consumers have a continued optimistic outlook toward purchases ahead, although they're not as confident as they have been in the past.

Modern Touch: Just what households buy varies, of course, from year to year. Perhaps the most tempting specialties markets are the owners of new homes—and estimates are that 1.2 million new, private, nonfarm dwellings will go up in '56. (About 1.3 million units were added in 1955; in 1950, a peak year, 1.4 million were built.) What trends in new homes affect the specialties maker?

Studies by such service magazines as *Better Homes and Gardens* and *Living for Young Homemakers* show that there's a continuing trend toward multiple bath dwellings—likely a growing need for sanitizing chemicals, as well as for soaps and detergents. Water softeners are a little more common than they were a few years ago. Paint, as in interior finish, continues high in popularity (in kitchens, in particular, paint gets the vote 80% of the time). It would seem that makers of plastic-treated wall-coverings should prove their products in the kitchen.

Outside the house, wood siding—which must be painted—is holding its own. Brick seems to be growing in popularity; it doesn't require paint, but could be a target for maintenance specialties.

Not everything gleaned from home building trends is favorable—fuel oil additive makers may be less than pleased by the slightly decreasing percentage of homes equipped with oil furnaces.

Naturally, new-home surveys such as these concern only the limited survey group of magazine-reading households. They can provide only broad generalizations—but these generalizations can be tip-offs to trends in general consumer wants and needs.

'56 Forecast for DISTRIBUTION

The next 12 months in marketing:

- Sales will forge upwards, may taper off toward the end of '56.
- Sales forces will expand, causing the toughest recruitment hunt yet.
- Transport costs are in for keen scrutiny, to-the-bone paring.
- Over-all selling costs will generally stay at current levels.

FOR the chemical company willing to hustle, 1956 will be a big year. Sales managers conservatively and commonly expect to better '55 figures by upwards of 10%. Some, already sold out for '56, are now at work on '57 orders. And while none forecasts a drop, some predict the pace may lessen in '56's closing months.

The 10% bonanza just won't happen of its own accord. Competition, as furious as ever, will call for redoubled sales efforts and minimized delivery costs to bring the business home.

More Men: Emphasis next year will fall primarily on expanded coverage by means of larger sales staffs. This, by far, is the most frequently contemplated change for '56. Depending on the firm, the buttressed forces will push new products, or call oftener, or probe unopened territories and accounts. There'll be more technical service in store *(CW, Nov. 26, p. 126)* and chances are there will be somewhat more stress on joint calls by service and sales representatives.

Coupling scheduled increases in sales force size with unabated demand for technically trained graduates to start with, it figures that the wildest scramble ever for sales manpower is in the offing. The problem of recruiting salesmen, perhaps the most serious problem that's confronted sales executives in recent years, should be at its worst next year. Still, it's unlikely, that you'll see much temporizing with quality; very few firms seem willing to experiment with scantily trained men.

Cartage Economy: While sales managers crack the whip for sales, traffic managers will be putting forth herculean efforts to slash shipping expenses. A 7% railroad freight rate increase, now being sought, should further spark this drive. Now often a significant part of delivered cost, freight charges will get the axe three ways:

- Upping activities to get customers to take larger quantities.
- Hiking weight of drum contents.
- Increasing use of water and highway transportation.

To vigorous toil in sales and traffic, add continued stress on packaging, anticipate more package standardization to reduce both costs and the number of sizes. Better appearance, larger sizes, and reflective lettering (for dark warehouses, unskilled stockboys) also loom for 1956.

Steady Costs: In spite of expansion, package-sprucing, and traffic cost-pruning, 1956 sales shouldn't be dearer. Costs are being calculated to stay in line (proportionately to volume); only a few chemical companies tell *CW* that they'll launch major reduction drives next year. Yet, there's apt to be a little more than usual matching of sales calls to account potential and efficient planning of salesman traveling.

Sales administration will have to push the wheel harder to climb the sales curve, but it won't get winded. About half of the firms contacted by *CW* believe that their present business setup can be used without any changes; the other half will tinker (mainly to tune, not for drastic revision) with sales structure. Most commonly mentioned adjustments:

- Tighter supervision of salesmen and distributors.
- Closer liaison with district office managers.

Sales management, at least for next year, appears to be assigning distributors a somewhat more prominent role. Chemical jobbers can count on stronger pressure to push product lines, weed-outs, more thorough training, and improved working relationships. Such work will help the distributor contribute to '56's bigger sales.

The business will be there next year but firms will have to dig for it—with larger staffs, sharper administration, more service, and shipping cost corner-cutting.

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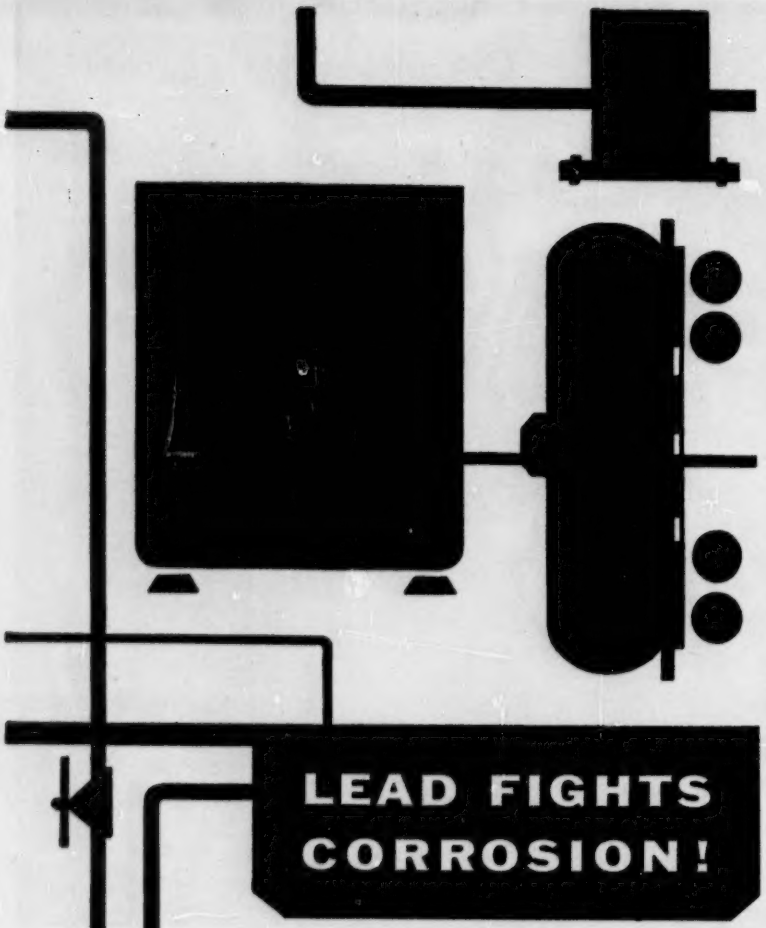

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SPECIALTIES

TODD'S GOSNELL: Formulating

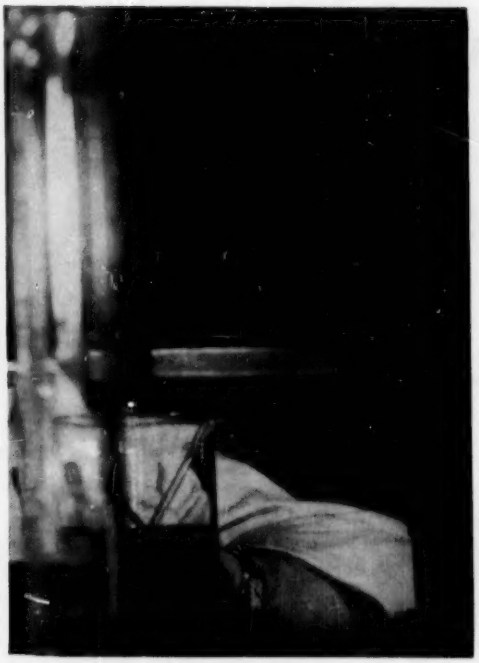
Chemists Check-

There are many advantages in paying by check (you have a record for taxes, an automatic receipt), but the most important is safety. The person or company that makes out a check and passes it on can feel fairly certain that he will end up paying out no more money than intended. Most check frauds these days involve complete forgeries, starting with a blank check —the alteration of legitimate checks is the least common variety of paper crime.

Check tampering's unpopularity as a criminal vocation is due largely to the work of a few ingenious paper chemists who specialize in making sure that things written on checks stay put. One of the most active of these researchers has been Earl Gosnell, inventor of The Todd Co.'s (Rochester, N.Y.) Protod-Greenback paper.

Todd produces, to customers' orders*, check blanks that have a couple

*Although it is still true that many banks will accept checks written on pieces of old wrapping paper, the tendency is to make check blanks take on as many jobs as possible. Aside from safety features, for example, modern checks also often bear company promotion—taking advantage of the fact that the average check is seen by 16 people.



surprises for check tamperers

mate Forgers

of surprises for would-be check-raisers: if they try to erase the old amount, the background design comes off with the numbers, and if they try to use an ink eradicator, the word "void" flashes to the surface.

PW Stationery: Booby - trapped checks are just one item in Gosnell's career of making paper safer. He grew up with the techniques, working in Washington during the years when paper safety was primarily a government interest. Gosnell was with the Government Printing Office from 1933, while still a student at George Washington University, until he joined Todd in 1950. One of his most important contributions came just before the war, when he coordinated and tightened all of GPO's far-flung research operations, considerably accelerating the safety paper program.

While in Washington, Gosnell developed such things as a counterfeitproof ration book, prisoner-of-war stationery that prevented use of invisible inks, special paper for absentee ballots, and an acid-free ink to prevent corrosion of post office pens.

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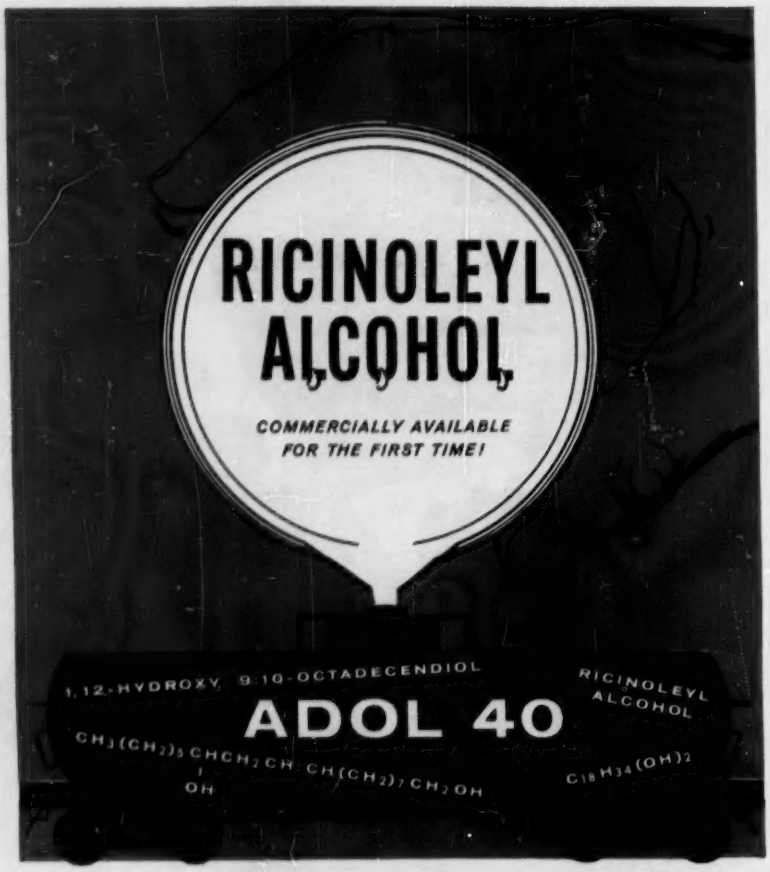

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Background Information: Since then, he has devised such forgery foilers as:

- An identification-card ink that smears if a solvent is used.
- A floating fluorescent design on plastic-covered identification cards, which is destroyed if tampered with.
- Invisible bands in inking ribbons that print letters that are varicolored under ultraviolet light.
- A paper marked with designs, visible only under ultraviolet light, that resist all alteration attempts, either manual or with the use of ink eradicators. (Developed especially for South American governments, these papers are now used for all legal transactions in those countries.)
- A photo-emulsion paste that glues identification photos firmly to a plastic laminate so that they can't be removed by a solvent.

Paper Losses: Considering how much of our economy depends on paper assets, it's easy to see how important these safeguards are. And the dangers involved are not only of interest to banks: 90% of the losses through forgery and tampering of checks are sustained by people outside of banks. But this loss has been kept low—largely through use of special papers. Of the estimated $25-million annual losses through fraudulent paper, only about $2.5 million now involve checks.

•

Six Silicones: Linde Air Products Co. (division of Union Carbide and Carbon Corp.) has six new organosilicone compounds aimed for uses as special lubricants, as release agents for rubber and plastics, in cosmetics, or as emulsifying agents or emulsion breakers. Special properties include good release, thermal and viscosity stability, water repellency, lubrication. The six are designated X-520, X-521, X-522, X-525, X-526 and X-527.

•

Bond Note: If joining ceramic articles—to other ceramic products or to metallic parts—is your problem, the technique worked out by Phillips Electrical Industries (London, England) might prove helpful. Phillips uses a mixture of finely powdered silver oxide (sometimes in combination with copper or cuprous oxide) to bond the parts — processing temperature is about 950 C, in a nonreducing atmosphere (British Pat. 739,543).

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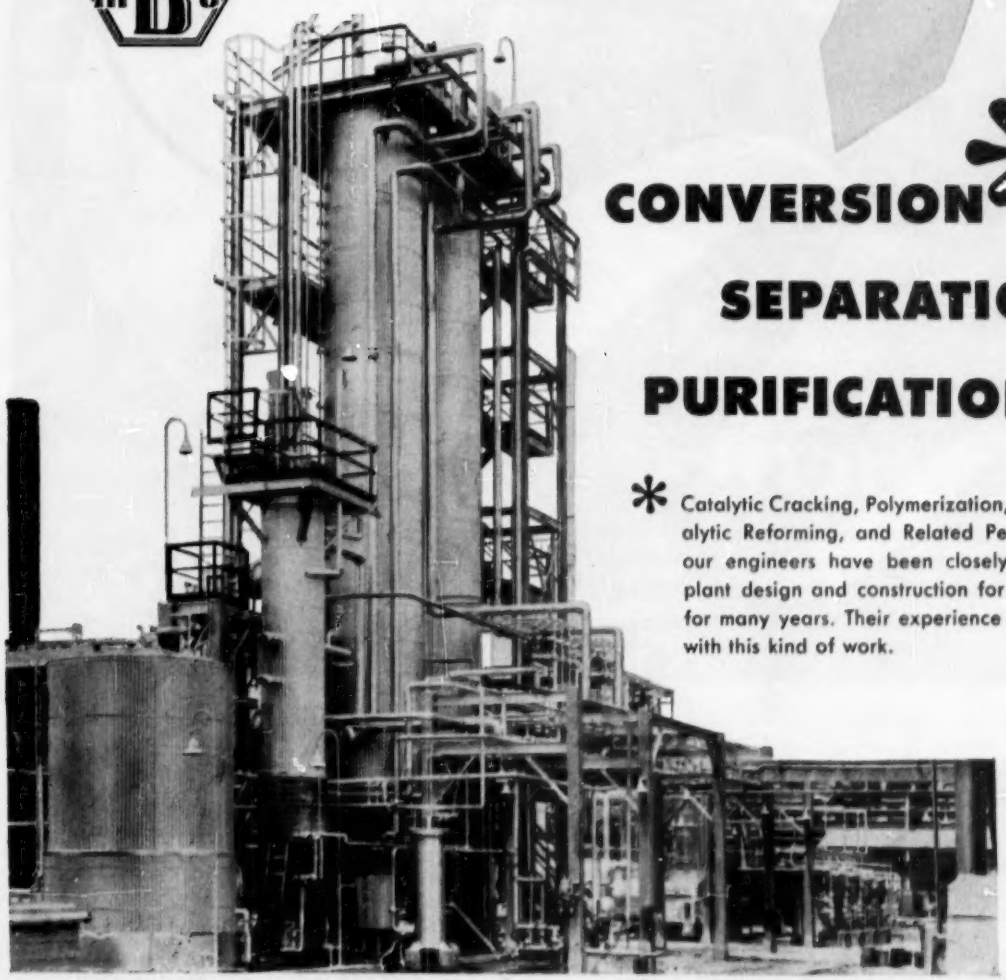

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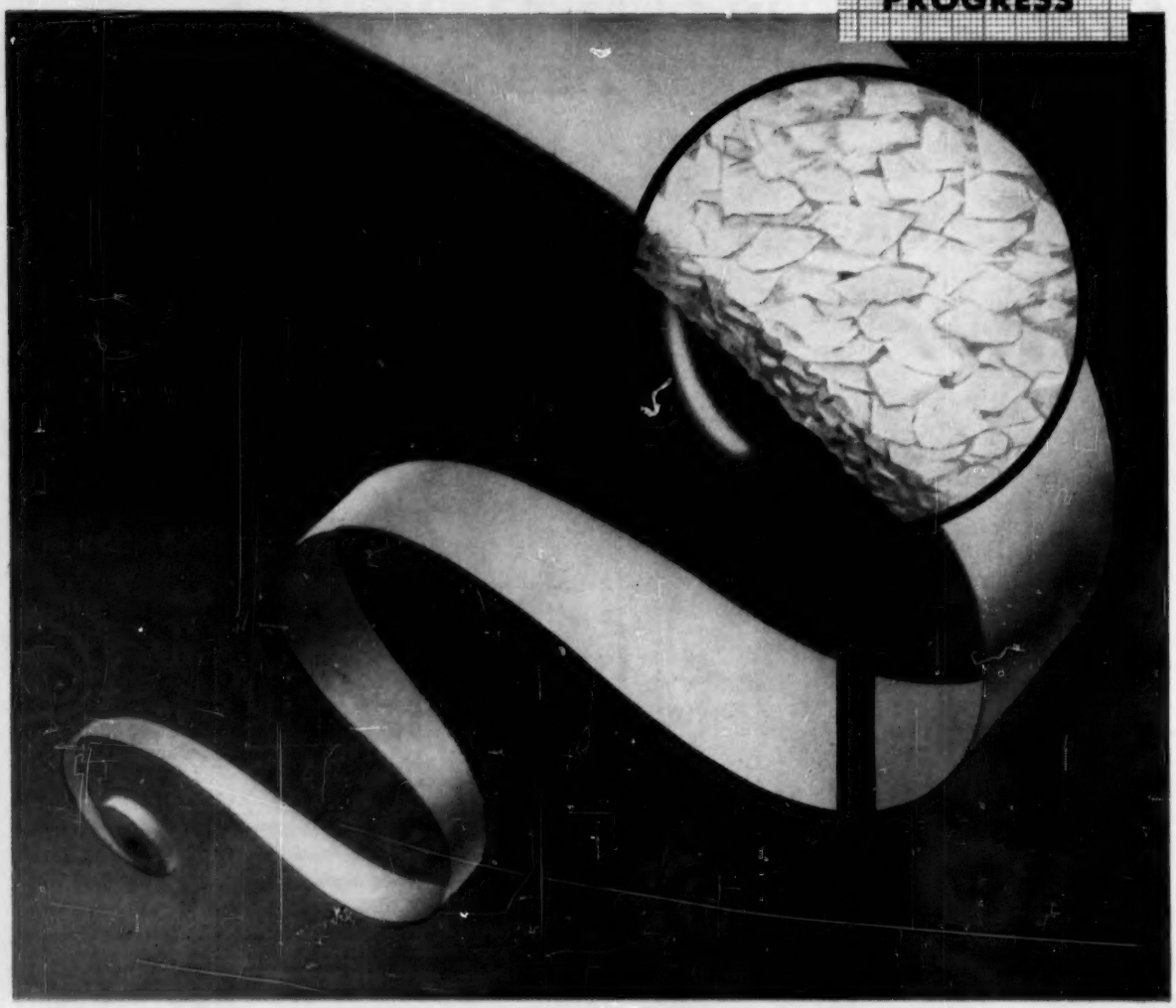
Q. *Could chemical science find a way to improve mica insulation for high-temperature electrical applications?*

A. **NOW...MILE-LONG MICA RIBBONS FOR ELECTRICAL INSULATION**

Another example of

CHEMICAL PROGRESS



Mica is basic for high-temperature electrical insulation. But up to now, its use has been limited—because it was rigid, difficult to apply. Could chemical science make mica *more flexible* for easier, broader application?

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Better than mica? Mica mat has far greater flexibility. It is more uniform, and completely free of voids. Less is needed for a given job, too: perhaps 25% less to insulate 10,000 volts.

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Market Newsletter

CHEMICAL WEEK
December 31, 1955

Next week may well be the most significant in the new year with respect to chemical market price changes. A raft of new schedules, to become official next week, will shift the over-all price structure upward, of course; but there will be some exceptions to the general rule.

Dangled as teasers are the marked-down, first-of-the-year price tags on American Potash and Chemical's lithium compounds; the producer's hope is that easier prices will have a "highly stimulating effect" on potential consumers, particularly in the grease, ceramic, porcelain enamel, and air-conditioning industries.

Lithium carbonate is now quoted at 82¢/lb. c.l., and 87¢, l.c.l., reflecting reductions of 3¢/lb. Contract tonnages of lithium hydroxide will enjoy bigger cuts—10¢/lb.—with prices of 80¢ and 81¢., c.l. and l.c.l., respectively.

Adjustment of Terylene polyester fiber prices toward more competitive levels is now possible, according to Canadian Industries Ltd., because large-scale plant production has been achieved.

Reductions, averaging about 11%, on Terylene filament yarn prices vary with different deniers and types. The 250 denier high-tenacity, for example —aimed mainly for industrial uses—is being reduced to $1.95/lb. from $2.30.

Crimp-set staple and tow are reduced 32¢/lb., down to $1.43, retroactive to Nov. 28. Terylene fiberfill (used in pillows, etc.) is now priced at $1.38/lb.

Stepped-up use of 2-methyl-5-ethyl pyridine, anticipated almost a year ago (*CW Market Newsletter, Jan. 9*), accounts for today's lower prices posted by Carbide and Carbon.

MEP prices, f.o.b. Institute, W. Va., are pegged at 43¢/lb. in tank cars; 44.5¢, c.l.; 45¢, l.c.l.

•

Consistent with the general price trend is a three-months-tardy hike on some phosphates; sodium tri-polyphosphate and tetrasodium pyrophosphate were held off the list when other phosphates increased Oct. 1. Reason: a few long-term contracts still bound some producers to old schedules.

Both chemicals will now sell for 15¢/cwt. more, f.o.b. plant, freight equalized.

Several other phosphates will join the family with "new look" prices. Monosodium-, disodium- and trisodium phosphates—all anhydrous—and hexametaphosphate will be upped 20¢/cwt. in bagged carloads and l.c.l. Bulk prices will be down an additional 30¢/cwt.

•

Add some reds and yellows to the list of organic colors already slated for Jan. 1 price increases. But word out of Sherwin-Williams, listing pigments and dispersed color prices, is footnoted, "No further increases are contemplated."

Typical advances: Para Reds (all shades), 5¢/lb. to $1.10; Plasticone Reds (all shades), 20¢/lb. to $4.60; Permansa Yellow G, 10¢/lb. to $2.10; and Benzidine Yellow (AAOT Type), 10¢/lb. to $2.35.

Close to 30 dispersed colors, with new prices ranging from $43.50 to $202/cwt., have in most cases been increased $2-2.50.

Market Newsletter

(Continued)

The coming tank-car increase on carbon bisulfide, reported here last week, will, in effect, turn out to be a reduction announcement for many consumers. Why? In addition to posting the 10¢/cwt. advance, producers will also switch pricing practice from an f.o.b. plant to a delivered basis.

Thus, with shipping distances long enough to more than offset the increase and makers absorbing the freight, tank-car customers will pocket a saving.

•

In the current atmosphere of swirling price changes, any commodity with half a chance of remaining steady is bound to attract attention. Soda ash is such an item. Contract prices were revised upward Oct. 1, of course, but despite a sustained large-volume demand, most trade followers predict no further change in price—at least through the first quarter.

Output of soda ash—now and probably for some time to come—will continue adequate enough to cover just about all conceivable consumer needs.

•

Some gum rosin users are facing an immediate increase in costs for their requirements. A few Southern producers' selling prices are up 10¢/cwt. this week. Reason behind the hike is twofold: a decided slump in crude gum production; a 5¢/cwt. upward revision in CCC prices.

Actually, with the gum producing season just about ended, producers will carry along with present stocks of rosins and turpentine for the next 3-4 months.

Somewhat delayed is Du Pont's decision to reduce some of its acrylic products, but a retroactive (to Dec. 13) clause brings it in line with Rohm & Haas' earlier move (*CW Market Newsletter, Dec. 24*).

Natural-color molding powders of Lucite acrylic resin are down 6¢/lb. (to 59¢ in truckloads), while bulk shipments of colored resins are cut, by a like amount, to 63¢/lb.

Du Pont's plastic intermediate, methyl methacrylate, will also bear a 3¢/lb. cut to 32¢ c.l., similar to Rohm & Haas'.

•

Selenium remains one of the few truly short items (*see Markets Forecast, p. 43*), but leave it to a Brooklyn company to figure out how to beat the shortage. Radio Receptor's solution: pay its distributors 10¢ for each used selenium rectifier brought in.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending December 26, 1955

UP

	Change	New Price
Disodium phosphate, anhyd., l.c.l., wks., 100 lbs.	$ 0.20	$ 8.05
Monosodium phosphate, anhyd., l.c.l., 100 lbs.	0.20	9.10
Sodium tripolyphosphate, bgs., c.l., wks., 100 lbs.	0.15	7.875
Tetrasodium pyrophosphate, anhyd., bgs., c.l., wks., 100 lbs.	0.15	7.525
Trisodium phosphate, anhyd., l.c.l., 100 lbs.	0.20	9.05

All prices per pound unless quantity is stated.

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A recently developed National Lead vinyl plasticizer, "Dutch Boy" NL A-54, steps up electrical properties and reduces cost in vinyl insulations.

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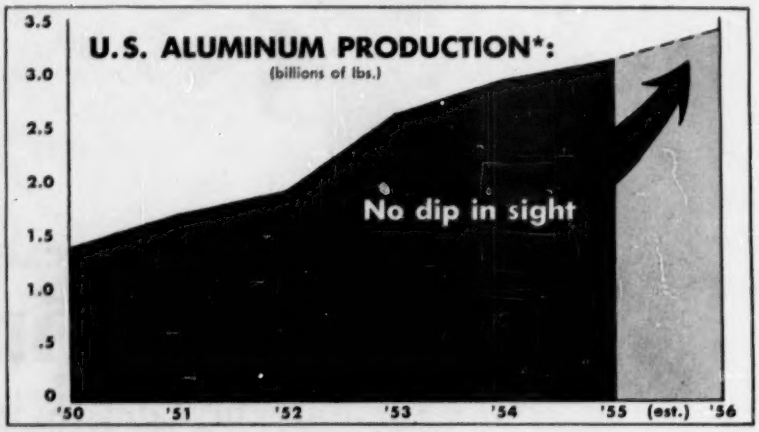

CONSISTENT UPTREND means more chemical sales.

Metallic Cheer

During the next six months, at least, the Office of Defense Mobilization will make no bid for further aluminum stockpile acquisitions. The amount to be deferred, when added to the material made available for civilian use by similar government decrees since the first quarter of '55, will total some 900 million lbs.

The ODM moves underscore the metal's continuing tight supply condition despite record-breaking production in the U.S. This year, for example, is the fourth in succession in which the aluminum industry has toppled previous output highs. Fairly firm estimates indicate that primary aluminum production during '55 will exceed 3 billion lbs. (*see chart*), or about 7% over the '54 total.

Within the next few years, though, chances are there'll be no need for government diversion to industry. If all aluminum production expansions now in the works are carried to fulfillment, U.S. capacity will be increased by more than 1 billion lbs./year, hit a fantastic 4 billion lbs./year.

Such bustling growth, of course, is a happy sight for more than one chemical company. Why? It takes a lot of chemical and allied products to produce a ton of aluminum. For instance, 2,000 lbs. of the primary metal requires about 4,000 lbs. of alumina, 1,300 lbs. of carbon paste, about 60 lbs. of cryolite, some 80 lbs. of aluminum fluoride.

Add, too, this further chemical aspect: to make 4,000 lbs. of alumina needed for a ton of aluminum requires 8,000 lbs. of bauxite, 240-600 lbs. of soda ash, 200-400 lbs. of quicklime, and 1,600-3,200 lbs. of coal (or 20,000-40,000 cu. ft. of natural gas).

Multiply those figures by the anticipated 2 million tons of aluminum capacity, and it tallies to a sizable business for chemical sellers.

Metal Rundown: In its latest year-end statement on the state of the industry, the Aluminum Assn. cites the continued rise in demand for aluminum products. Among the multiplicity of outlets, building materials led the entire field during 1955, accounted for about 19% of all wrought aluminum mill products shipped during the first half of the year.

Transportation applications took some 17%; consumer durable goods consumed 13%. Other aluminum takers: electrical uses, 8%; machinery and equipment, 7%; packaging and containers, 5%.

Slated to boost aluminum sales even higher soon: colored porcelain-enameled aluminum sheet on building exteriors; aluminum wire in communication cables.

As aluminum consumers—both government and civilian—increase their take of the lightweight metal, the chemical industry, for one, will have cause for cheer.

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Steroid Pace Setters

Two new synthetic hormones reflect the current brisk pace of steroid research. The pair: 2-methyl-9α-fluorohydrocortisone and 2-methylhydrocortisone, reported by the Upjohn Co. (Kalamazoo, Mich.). Like aldosterone, the newcomers have secondary therapeutic value: they are more significant as clues in the quest for superior hormones to combat rheumatoid arthritis, allergies, etc.

And that's true despite the fact that the fluoro compound† features three times aldosterone's potency (and about 40 times that of hydrocortisone); 2-methylhydrocortisone is about 10 times as active as hydrocortisone by glycogen (animal starch) liver deposition assay.

Although aldosterone has finally been synthesized (*CW, Aug. 6, p. 70*), it is still extremely scarce. Upjohn hopes the newcomers will augment aldosterone's role in biological research, replace aldosterone as a standard for gauging steroid activity.

A new intermediate—2-methyl-11β,21 - dihydroxy - 4,17(20) - *cis*-pregnadien-3-one (from progesterone)—is the key to the potentially valuable Upjohn steroids. Section head John Hogg abetted by chemists Frank Lincoln, Robert Jackson, William Schneider; and biologists William Byrnes, Lester Barnes, Barbara Bowman, William Dulin, Ervin Morley, and Robert Stafford are the people who doped out the synthesis, evaluated the product

Encouragement for increasing activity in this field derives largely from the warm commercial reception afforded recent products of research.

The new arthritis drugs, prednisone and prednisalone (*CW, Nov. 20, '54, p. 82*), for example, are expected to push this year's adrenal steroid sales well over the 600 kg. mark (from less than 500 kg. in 1954).

The hope is that equal success is awaiting new steroid fungicides, anesthetics, sedatives, etc.

Here's how some leading firms are faring in their drive to open new markets for steroids.

• Pfizer, encouraged by the results of continuing clinical trials of its new steroid anesthetic (*CW, June 4, p. 64*), is boosting the budget for steroid research, recently garnered British patent 740,858 (on production of an 11-oxygenated steroid via the fungus *Eurotium*).

• Ciba, reportedly studying combi-

*Barbara Bowman, Lester Barnes (left) and Robert Jackson.

†Earlier fluorinated cortisone derivatives, pioneered by E. R. Squibb & Sons (*CW, June 13, '53, p. 50*), are finding topical use against certain skin ailments. Recently, 9-α-fluorohydrocortisone—which has 10 times the antirheumatic potency of hydrocortisone—was clinically tested (*CW, March 19, p. 70*), found to be too toxic for internal use.

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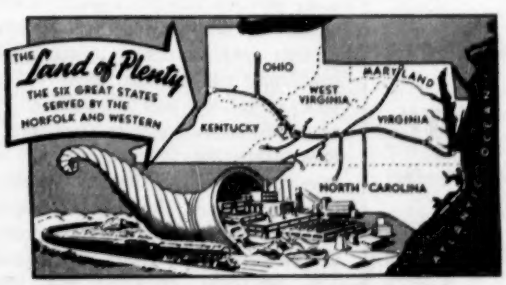

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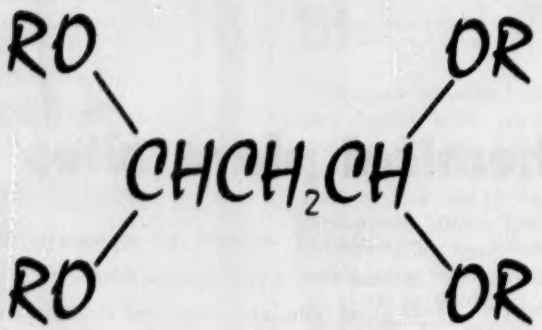

suggestions cross-linking agent; insolubilizing agent; substituted pyrimidine building block; usual dialdehyde reactions; pyrazole intermediate

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nations of aldosterone and other steroids in surgical shock treatment, has been granted British patent 741,061 on a steroid synthesis using an electrophilic agent in the presence of ether.

• Upjohn is the recent recipient of a brace of British patents (740,987 on 11 α-oxygenated-3, 17-dihydroxypregnane-20-one preparations; 741,120 on recovery of steroids from aqueous dispersions containing fermenting material), has also been granted U.S. patent 2,726,240 on production of a diepoxypregnane.

• Lederle, a new entry into steroid research, won't say what course it has in mind, but denies reports that it is working on a new steroid anesthetic.

• Canada Packers Ltd. (Toronto), an important beef bile processor, now turns out cholic acid and desoxycholic acid as raw materials for cortisone and related steroids. It conducts steroid research at a new $1 million laboratory, recently turned up improved process for cholic acid production (U.S. patent 2,697,105), recently retained New York consultant Norman Applezweig for liaison with U.S. pharmaceutical houses, hopes to develop a wider assortment of uses for its enzymes, hormones, and bile acids.

Right now, a large segment of steroid research is concerned with the development of better starting materials for such drugs as cortisone, prednisone, etc. Both animal and vegetable sources are under study. New compounds (e.g., gentrogenin and correllogenin, *CW, Oct. 29, p. 99*) arising from this work could prove threats to existing precursors.

But steroid researchers have only scratched the surface; total synthesis of extremely complex steroids (with the exception of cortisone) is a still-to-be-accomplished feat that could have major commercial impact.

•

Foreign Intelligence: Armour Research Foundation (Chicago) will soon set up a European office to keep watch on technological developments in that area. Designed primarily for small and medium-size firms (which lack large overseas branches), the plan will maintain four engineers to look after the interests of the 16 noncompeting firms that will be asked to subscribe. As the plan is shaping up, sponsors will be sought in groups of four—probably from the mechanical, electrical, chemical and what

How to put static electricity on the run

A new spray-on material for rugs eliminates those unpleasant shocks you get after walking across them and touching a doorknob. The product contains a Du Pont surface active agent which forms a conductive coating on the rug's surface. Static electricity, generated as the foot passes over the rug, is drained off over a large area.

Knocking the shock out of rugs is the latest application of this surface active agent. The textile industry has used it and related Du Pont compounds for some time to eliminate static in manufacturing processes. There may be new and completely different uses for this surface active agent . . . *your* uses.

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WRITE US ON YOUR COMPANY LETTERHEAD and give us the details of the application you have in mind. Let us suggest a surface active agent that may do the job. Address: E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Wilmington 98, Delaware.

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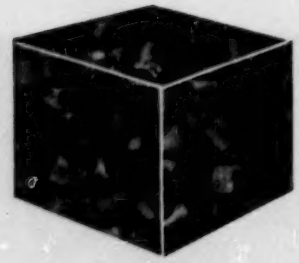

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ARF terms the "chemical engineering" industries. Each engineer will be responsible for the four companies in his field, and that includes the performance of special technical commissions for sponsors.

•

Debut: No sooner had it commissioned new laboratories at its Springfield, Mass., plant recently than Shawinigan Resins revealed plans for still another research expansion. To cost more than $300,000, the new construction will begin shortly, with occupancy slated for the latter part of next year.

The recently completed addition doubles the company's research facilities, provides working space for more than 40 chemists.

•

Wholesale Offering: Forty-one U.S. patents held by the Atomic Energy Commission are being released for nonexclusive, royalty-free licensing. Included: method of producing zirconium halide (2,716,051); polyethylene coating and method of applying same (2,716,075); liquid metal high-pressure pump (2,716,943).

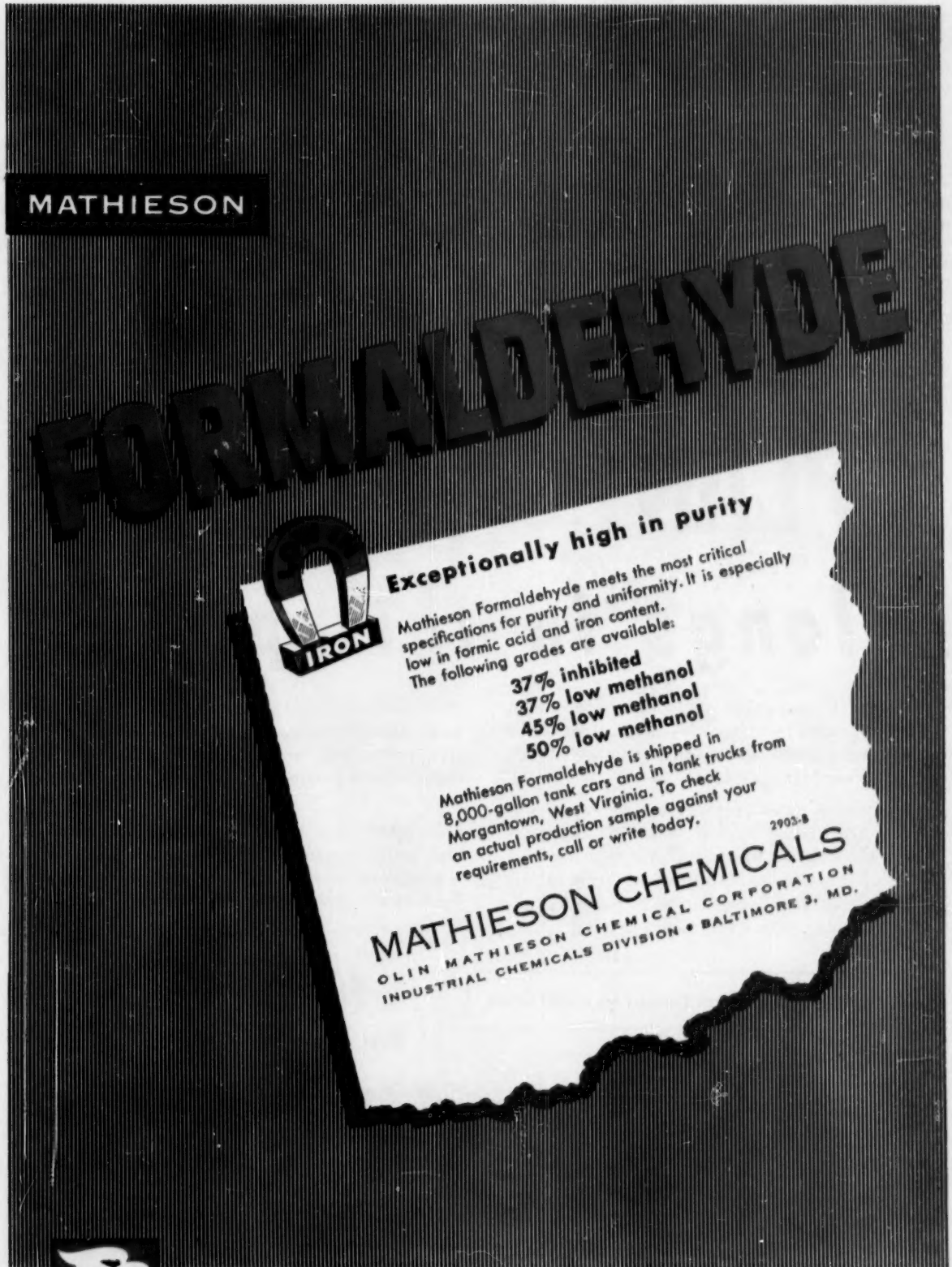
NEW CHEMICALS

Pyridines: Four new pyridine derivatives started job-hunting last week. Products of Reilly Tar & Chemical, they're diphenyl-4-pyridylmethane, diphenyl-4-pyridylcarbinol, phenyl-4-pyridylmethane and phenyl 4-pyridyl ketone (the last two are alternatively named 4-benzylpyridine and 4-benzoylpyridine, respectively).

All are strictly research items with foreseeable uses now largely limited to synthesis intermediates: 4-benzoylpyridine is convertible to various carbinols; diphenyl-4-pyridylmethane (by dint of an active hydrogen) is useful in preparing other members of this series.

•

Amines: Dialkyl methyl tertiary amines are Armour Chemical Division's contribution to the week's new products. Designated Armeen M2HT, M2C and M2S, the compounds derive their alkyl groups from hydrogenated tallow, coco or soya, respectively. Principal potential use: in the preparation of dialkyl quaternary ammonium emulsifiers, germicides, textile softeners, and corrosion preventing agents.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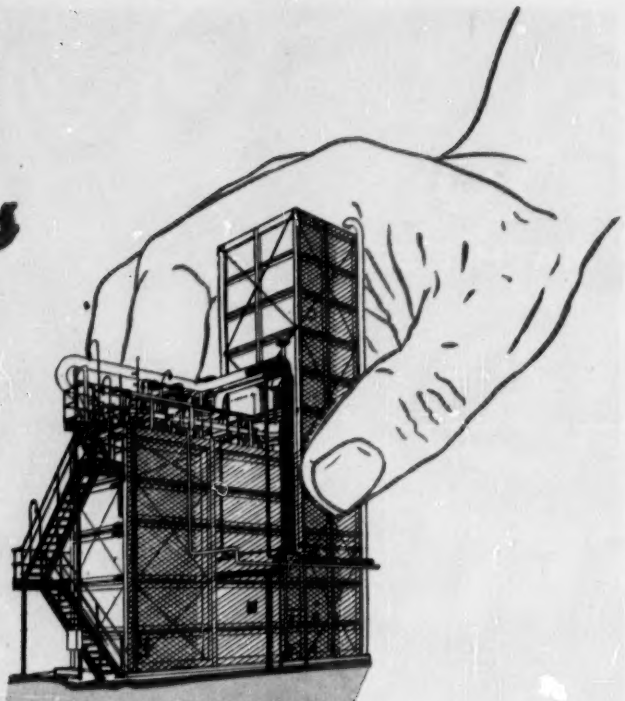
2903

An *Air Products* OXYGEN PLANT *belongs in this picture*



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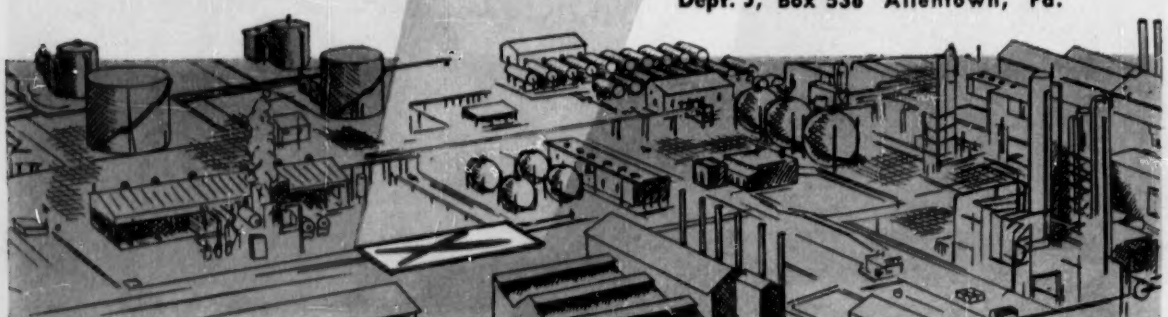

Cost Analyses • Process Design • Apparatus Design • Apparatus Manufacture

Technology
Newsletter

CHEMICAL WEEK
December 31, 1955

A much-needed laboratory technique of evaluating "mental" drugs received center-stage attention at last week's Atlanta, Ga., meeting of the American Assn. for the Advancement of Science. As described by Army Chemical Center researchers Amedeo Marrazzi and E. Ross Hart, the method measures the effect of chemicals on the operation of synapses—or nerve switchboards—of the brain.

In the words of the Army team, this is done "by 'tapping in on the line' in cats and recording the minute electric currents generated by the 'outgoing calls' that arise when test messages are sent in."

In actual laboratory use, this cerebral wire-tapping is used to determine how well a prospective "mental" drug is able to offset the impedance in nerve-impulse transmission produced by such hallucinogenic agents as mescaline. To test the validity of this hypothesis, Marrazzi and Hart subjected three tranquilizers of proved efficacy—azacyclonol, chlorpromazine and reserpine—to their bio-electric sifter.

All came through in good form, which leads most investigators to believe that the method will provide a rapid, reliable measure of the clinical effectiveness of new experimental agents.

•

High-level conferences at M. W. Kellogg this week are determining the immediate future for the Oregon Forest Products Laboratory process of extracting wax from Douglas fir bark (*CW Nov. 7, '53 p. 46*).

There's no official word on what the decision will be; but indications are that Kellogg will decide to commercialize the process. A good bet on size would be in the neighborhood of 3 million lbs./year. Likely site: Oregon—either Coos Bay or Eugene, both of which are in the areas that have ample supplies of bark. (The Coos Bay area is now the largest exporter of lumber in the U.S.)

The process is essentially a solvent extraction, produces about 150 lbs. of wax, 150 lbs. of tannin and 100 lbs. of dihydroquercetin from a ton of Douglas fir bark. It was developed by E. F. Kurth of Oregon Forest Products Laboratory of the Oregon State Board of Forestry, Corvallis, Ore. (on the Oregon State College campus). Kellogg, which took an interest in the project about three years ago, has pilot-planted the extraction portion at Wilson, Ark.; the refining was done at the firm's Jersey City plant.

Kellogg produced about 5,000 lbs. of wax. Test-marketing in U.S. and Canadian markets was carried out by Cornelius Products (New York City). The product is said to have shown excellent solvent binding power, high gloss, acceptable hardness and high melting point. In fact, the process has been highly thought of for some time; the main question at the conferences is economics.

Not so far along as the wax-from-fir project is a U.S. Dept. of Agriculture process to get wax from rice bran, in conjunction with the solvent extraction of rice oil. The process has, however, been probed on a small scale at the department's Southern Utilization Research Branch in New Orleans. And a just-completed study, it says, shows that additional equipment needed to obtain the rice wax can be "installed and operated in a rice oil plant at costs reasonable enough to make the venture profitable."

The idea of getting wax from such materials, of course, goes way back. The enticing goal is the fat market for carnauba (*CW, Oct. 29, p. 83*). Wax obtained from sugar cane by solvent extraction is already a commercial reality. And other ideas include one for getting it from Spanish moss, in Florida.

The difficulty is that the same qualities that pushed carnauba into its present prominence make it hard to dislodge: it gives a lot of wax value for the money.

•

Look for a lot of activity soon in processes to oxidize xylenes and related compounds:

Oronite is due to bring in its big isophthalic acid plant momentarily. Standard of Indiana has declared itself "in" by obtaining an interest in Scientific Design's process. Hercules—which has been making dimethyl terephthalate commercially since May—has obtained rights to a competing process and is quietly putting it through its paces on a lab scale. Richfield Oil has been working on a Stanford Research Institute process, is presently weighing the desirability of building a plant.

The trick in the processes is that one of the methyl groups in, say, *p*-xylene oxidizes readily enough to give the corresponding toluic acid. But the second group goes only with difficulty, and the conditions of the reaction have to be stiffened. That usually chews up the ring. The ways of avoiding that form the main basis of difference between the various competing processes. Here's how they shape up at the minute:

• It has been known for some time that Scientific Design has had a process of making terephthalic acid (*CW, Dec. 19, '53, p. 37*). But very little is known about its details. Most likely, however, it's a liquid-phase catalytic air oxidation.

• Hercules has circumvented the difficulty—for the dimethyl ester—by esterifying the toluic acid first, then oxidizing and, finally, esterifying once more (*CW, Jan 30, '54, p. 64*). Though this process is attractive from many standpoints, Hercules' newer version looks good, too, and could well be the route chosen for any future expansion of its DMT production.

• Standard of California, which has the dominating patent for the Hercules process (U.S. Pat. 2,653,165), uses, in the new Oronite plant, a chemical oxidation of *m*-xylene to make isophthalic acid. The firm is keeping its counsel about details of the process, but it's undoubtedly covered by a series of patents recently assigned to it (U.S. Pats. 2,722,546-7-8-9).

• Richfield uses a combination approach, air oxidation for the first group and a chemical oxidation of the second (*CW Newsletter, April 2*).

• The classic route for oxidizing xylenes, of course, is by means of nitric acid.

All the activity presages a fuller life for the xylene family, eventually. Now, *o*-xylene is used by Oronite to make phthalic anhydride (by an air oxidation). With the growing market for polyester fibers like Dacron and Terylene, *p*-xylene, seems ripe for a boost. The isophthalic acid project by Oronite marks the first full-scale, chemical use for the meta isomer. Future activity most probably will hinge on the success of Oronite's venture.

•

Added intelligence: Pentaerythritol is the starting material for the chlorinated polyether resins (*CW Technology Newsletter, Dec. 10*) now being pilot-planted by Hercules.

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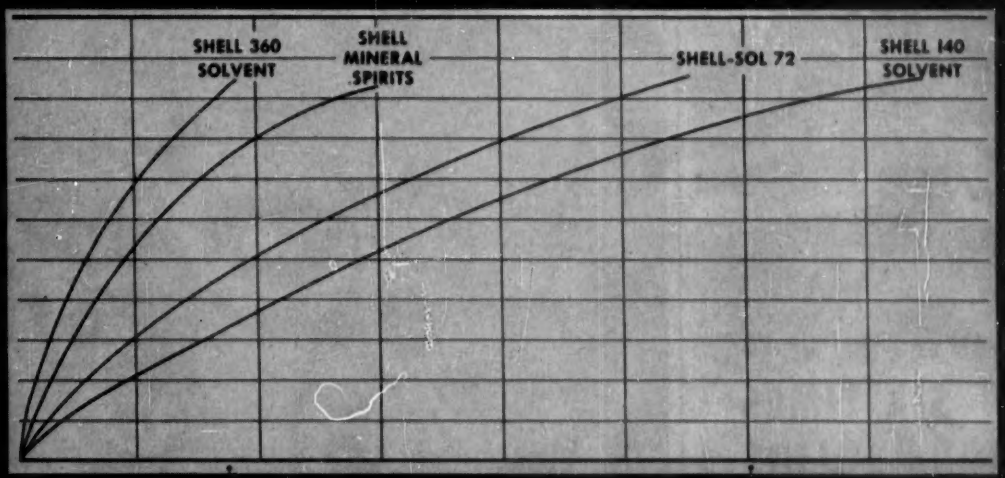

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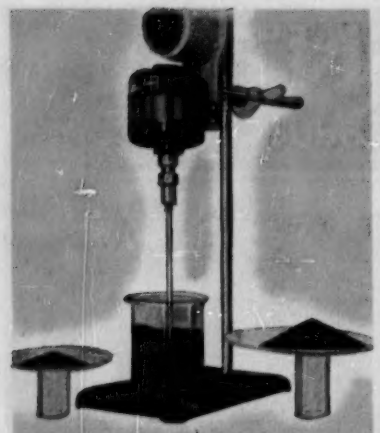

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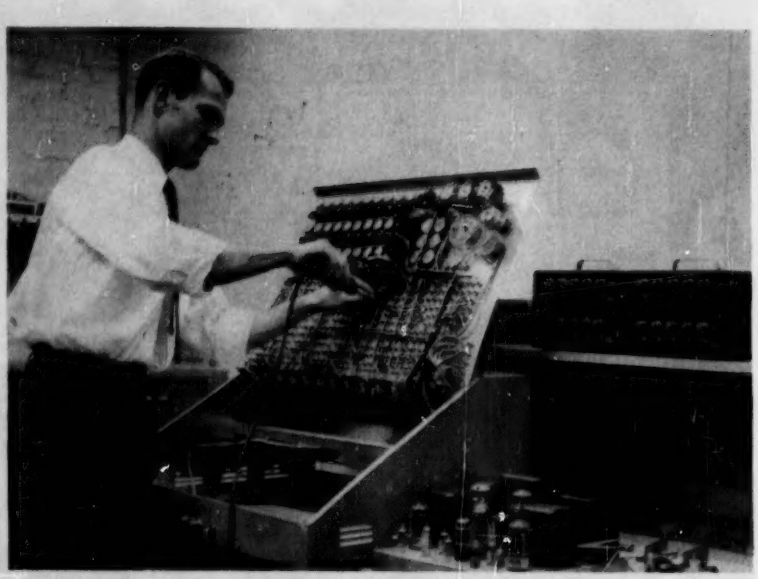


ASSEMBLING THE COMPONENTS: Analogs can be simpler than you think. Now, it's a . . .

Do-It-Yourself Computer

There's almost no limit to the size and complexity of projects that are considered fair game for the do-it-yourselfer.

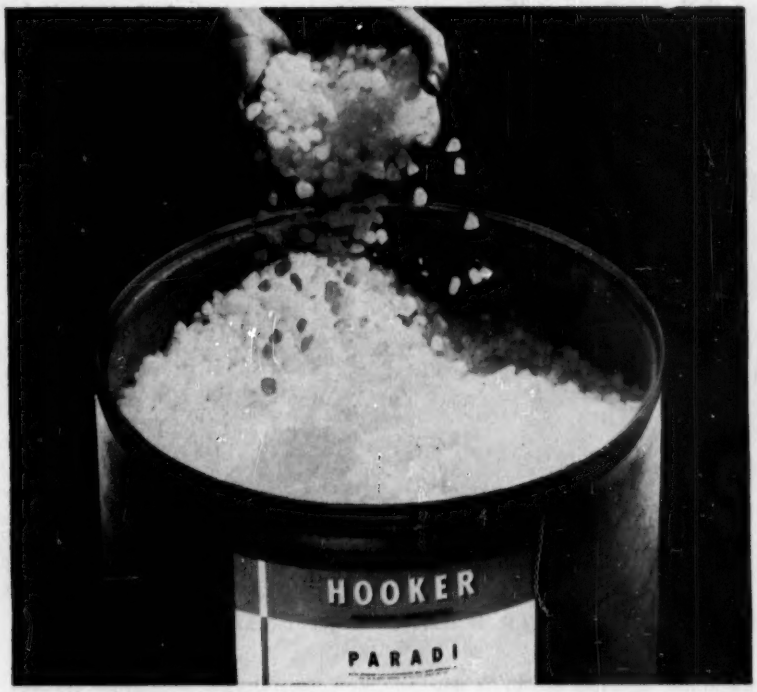
Latest device to be reduced to ready-to-assemble kit form: Heath Co.'s (Benton Harbor, Mich.) electronic analog computer. It's designed to take the computers out of the heavy-capital-investment class.

At first glance, the analog's maze of wires and electronic components appears forbidding enough to challenge even a thoroughly experienced technician. But, as Heath points out, the computer is assembled with building blocks—amplifiers, multipliers, function generators—which, individually, are not too difficult to be handled by the average man. It's estimated that anyone who can follow directions and wield a soldering iron can put the computer together in about 220 hours.

Engineering know-how comes built into the unit by experts. Chalmer Jones, assistant to Heath's president and formerly product line manager at Beckman Instruments, set forth the general specifications for the low-cost instrument. Heath engineers, drawing on their experience with other electronic tools in kit form, translated the ideas into functional, foolproof circuitry.

Ready Market: As Jones sees it, the do-it-yourself computer is made to order for a growing low-budget market. The increasing utility of the electronic analog (*CW, April 16, p. 80*) has proved its worth as an advanced slide rule and design tool in chemical plants. Small chemical plants (as well as educational and research groups) that balk at the high ($1,000-$400,000) cost of conventional built-to-order computers should find the kit's $700 tab easier to take. Also, Heath figures the lower price might be enough to bring in large companies. For, although they could afford the more expensive units, the whole idea of analog computers would be inherently more attractive at the lower starting price.

Basically, a computer may be classified by four criteria—cost, accuracy, convenience and flexibility. In the case of the do-it-yourself computer kit, the first—cost—was a governing factor. By its very nature, the kit eliminates almost all of the quite considerable labor cost that goes into custom-built instruments. The only other place where savings could be made was in the cost of component electronic



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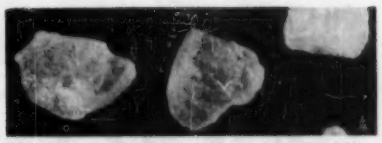
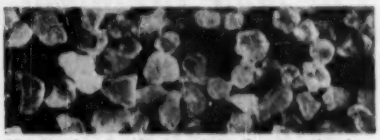
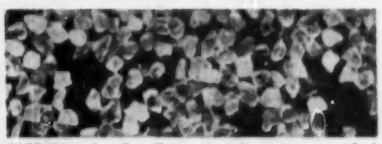


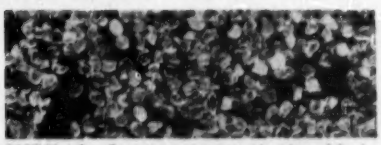
PEA No. 1—Repackage these big sparkling crystals, just as they come from the drum.



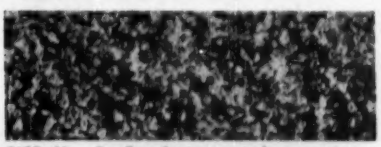
PEA No. 2—Another good size for repackaging.



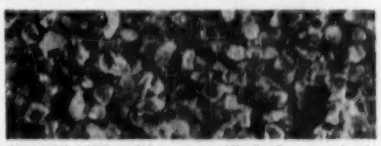
RICE No. 1—Smallest crystals recommended for straight repackaging. Many housewives prefer this finer size.



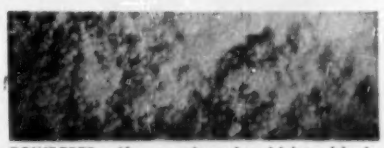
RICE No. 2—For power compressing into blocks and pellets. Exceptionally free-flowing for automatic presses where dies must be refilled rapidly.



RICE No. 3—For foot-operated presses you need a finer size like this, free-flowing but small enough to pack and compress easily.



GRANULATED—Often specified for agricultural use.



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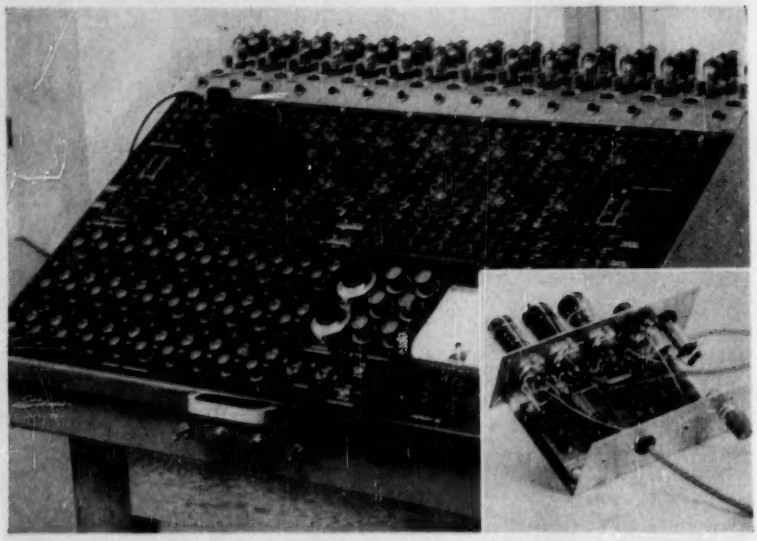
Story begins on p. 70



COMPLEX COMPUTER is built of simple blocks, like amplifier (inset).

materials. And this had to be done in such a way that accuracy, convenience and flexibility would not be sacrificed unnecessarily.

A key component designed to insure a high degree of accuracy is the computer's readout meter. Primarily required for the reading of amplifier outputs, initial conditions, and other voltages that might appear in the circuitry, it doubles as a means of accurate calibration for various other components. A null-balance network increases the meter's sensitivity, provides readings that are accurate to 0.1%.

Another innovation that's in evidence on the computer patchboard is the schematic layout of amplifiers. The arrangement not only minimizes the number of patchcords required, but also provides a logical diagram when fully patched in. Too, the construction permits R-C units to be plugged in from behind, as well as on the face of panel, to simplify setting-up. For example, a simple second-order differential equation that would require 25 pieces to patch up on many conventional computers can be set up with only 8 pieces on the schematic amplifier layout.

Completely assembled, the basic computer houses 15 amplifiers, 30 null-balanced coefficient potentiometers, 2 auxiliary 10-turn potentiometers, 6 floating initial conditions, 4 dual bias diodes, 4 multipliers, 2 function generators, 22 external connectors, 1 metering circuit with dividing network, and 2 operational relays. Printed circuits and top-quality materials are used throughout to simplify construction and assure high-stability performance. Slaved to an existing installation, it provides additional amplifiers and auxiliary patchboard. And it can be used to pretest simple circuits to conserve operating time of a larger computer.

Orders Waiting: Though Heath won't have the analog kit on the market until around the first of March, it has already lined up 44 prospective customers. The takers include one group of 10 Midwestern engineers who plan to chip in $70 apiece for the computer they can't squeeze out of their employer's tight budget.

Looking beyond the do-it-yourself kit's appeal to small organizations, Jones believes it will be a big help in selling the advantages of analogs to large companies as well. And as engineers acquire a better understanding of how computers work through the experience of building one, they'll come up with new ideas for utilizing analogs.

Long a booster of analog computers, Jones says they're a lot like drug addiction: make it easy for a man to become "hooked" on the computer narcotic, and it won't be long until he starts to crave more of this engineering aid in bigger doses.

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MAGIC WORDS: Stein, Hall management listens, finds purchasing agent's . . .

Straight Talk Fans Sales

As sales executives busily revamp sales policies this week for the year ahead at Stein, Hall & Co. (New York), they're getting substantial help from a new wrinkle in their just-held annual sales meeting.

Stein, Hall (adhesives, starches) gave the floor for a whole afternoon to three purchasing agents from industries that it serves. Result: this view of its sales activities proved so valuable that changes have already been made.

Letting the purchasing agent lecture sales management isn't brand-new, of course. Nevertheless, the practice is capable of producing many a benefit. Although the whole session took only a few hours, Stein, Hall's Vice-President Daniel Lipman cites these impressive gains:

- Motivation knowledge. The firm picked up insight into key factors of the customer's buying decision. (For example: service for one customer was as important as price.)
- Salesman know-how. Annoying habits of salesmen (in general), such as getting too familiar too fast with the agent, not following regulations, not asking for the business, came to light.
- Buying procedures. Here, the concern found out how the specific departments operated, who should be contacted for what products, how often the salesmen should call, when company executives should accompany the field men, etc.

As one result, Stein, Hall will probably change considerably its entertainment and Christmas gift policy. And company salesmen are apt to become particularly cautious in attempting to place relationships with agents on a personal friendship basis. Too, as the products of the meeting become further digested, other changes will likely follow.

To get the tangible gains that the firm is now counting didn't require elaborate preparation. Stein, Hall merely invited agents from companies representative of the industries it serves, suggested a list of possible topics, scheduled time at its annual executive sales meeting, and let the guests and an inquisitive audience do the rest. Unused topics, which were "planted" in the audience as questions (in the event that querying slowed), were never used. Straight-from-the-shoulder talks on salesmanship were more than enough to keep the audience keyed.

For Tomorrow's Reference: Stearates—35-p. bulletin describes specifications and uses of metal stearates. Witco Chemical Co. (New York).

• Chlorine storage — wall chart gives 50 tips for safe chlorine handling. Diamond Alkali (Cleveland).

• Trucking costs—folder reviews elements of figuring expense of vehicle ownership and operation. Elwell-Parker Electric Co. (Cleveland).

• Lithium carbonate—brochure provides assay and water-solubility data and suggested applications. American Potash & Chemical Corp. (Los Angeles).

• Latex resin emulsions—bulletin describes use and recommended concentration of monomers, emulsifiers, protective colloids and other chemicals for latex resin formulation. Carbide and Carbon Chemicals (New York).

• Vinyl lacquer flatting—bulletin gives test data on Syloid 244 for use in producing low-gloss vinyl films. Davison Chemical Co. (Baltimore).

• Cyclohexanol—fact sheet furnishes physical constants and stability, reaction and toxicological information. Monsanto Chemical Co. (St. Louis).

• British industries directory—1956 edition of the Federation of British Industries' Register of Manufacturers is now available. Iliffe & Sons, Ltd. (London).

• Diisocyanates—bulletin supplies generic properties, facts on 27 basic reactions, eight pages of potential applications, and 132-item bibliography for diisocyanates. Five others give specific data for Nacconates 80, 65, 100, 200, and 300. Allied Chemical and Dye Corp., National Aniline Division, (New York).

• Silicone Guide—1956 edition describes almost 150 silicone products, is grouped by physical form and cross-indexed by end use. Dow Corning Corp. (Midland, Mich.).

• Data sheets—Kawecki Chemical Co. (New York) now has available brief bulletins giving chemical, physical, and end-use information for potassium titanium fluoride, potassium zirconium fluoride, potassium fluoroborate, titanium-aluminum master alloy, titanium-boron-aluminum master alloy, boron-aluminum master alloy, and zirconium-aluminum master alloy.

• Catalysts—folder describes uses and forms of catalysts. Harshaw Chemical Co. (Cleveland).

Expanding Sales Coverage: Dow Chemical Co. will open a new sales office in Buffalo, N.Y.

• American Cyanamid Co. plans to install an office in Cleveland for the Refinery Chemicals Dept. of its Industrial Chemicals Division.

• Pennsylvania Industrial Chemical Corp. is opening new warehouses at Detroit, San Francisco, Los Angeles.

• Wilson & Geo. Meyer & Co. Intermountain—West Coast distributors of agricultural and industrial chemicals—has a new office in Denver.

• Hercules Powder Co. is setting up new sales offices at Minneapolis and Detroit.

• Canadian Industries Ltd. will build a $300,000 distribution center at Halifax, N.S., to house district sales offices and its agricultural chemicals, ammunition, explosives, chemicals, paints and Fabrikoid divisions.

• Rohm & Haas Co. is planning a warehouse and office building at Niles, Ill., to serve the Chicago area.

• Delemonte Plastics Corp. (Los Angeles), West Coast representatives for Ciba Co., Inc., will add 10,000 sq. ft. of warehouse space.

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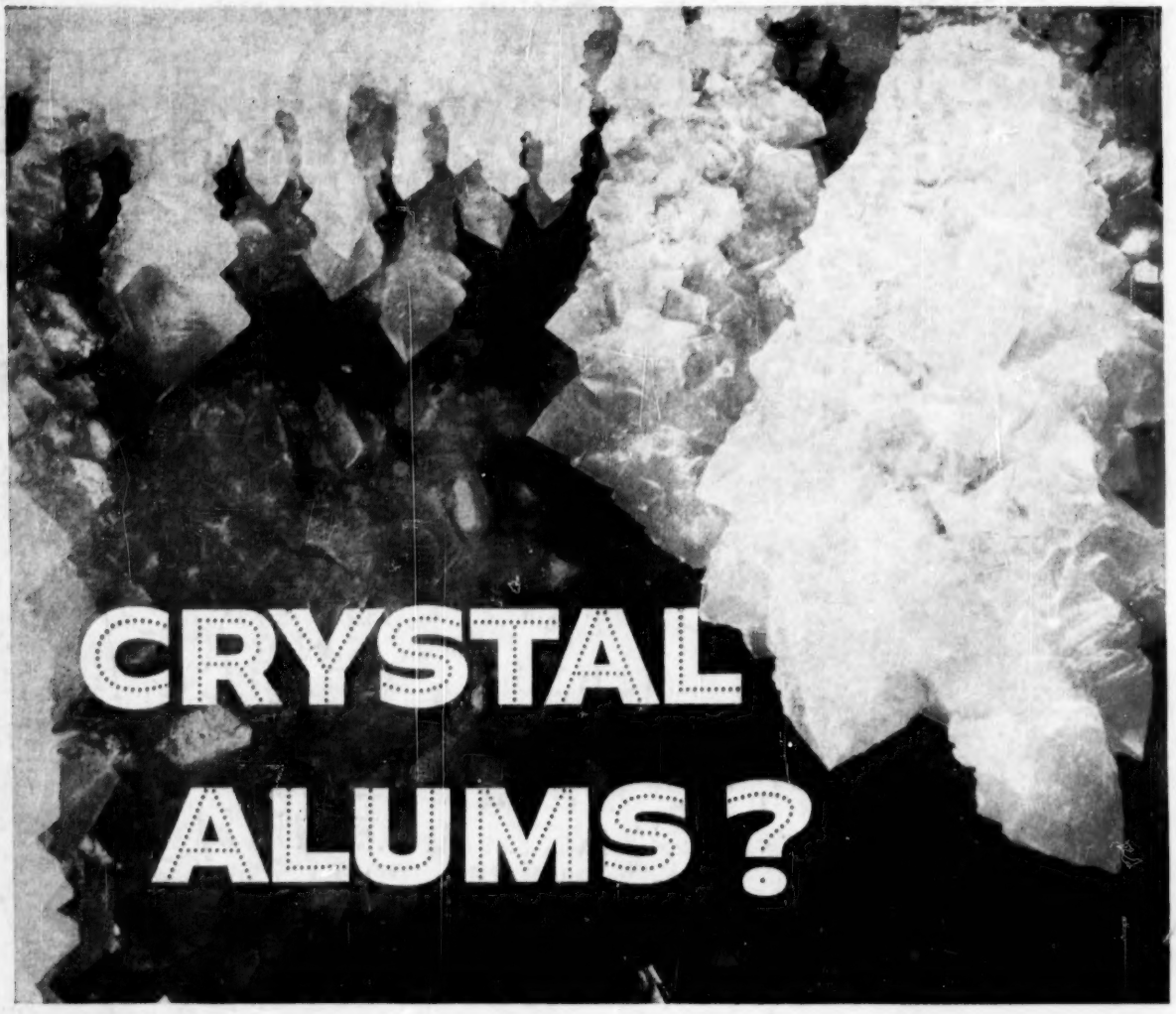

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